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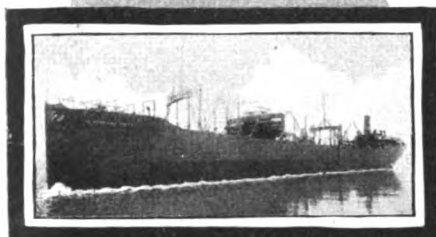
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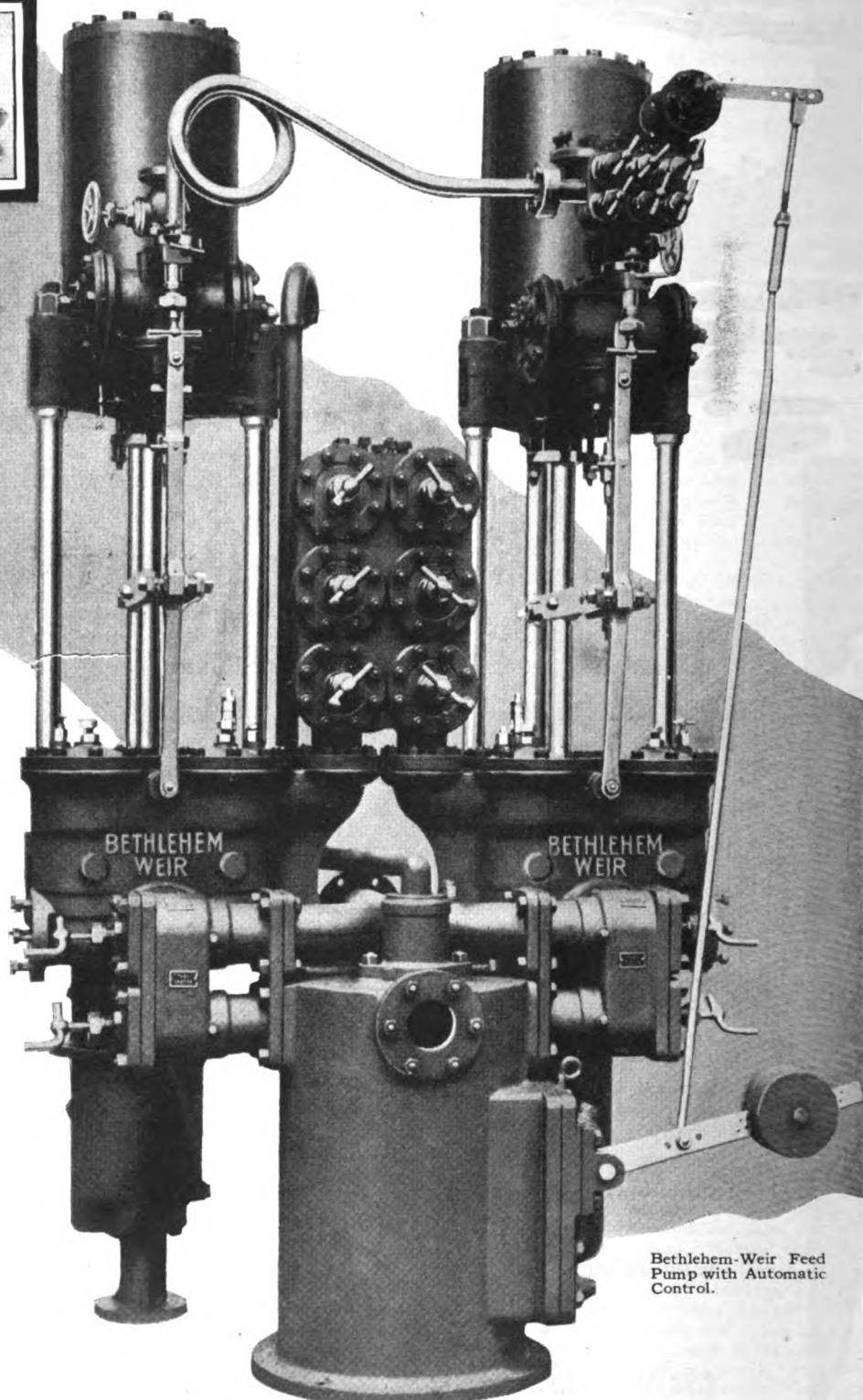
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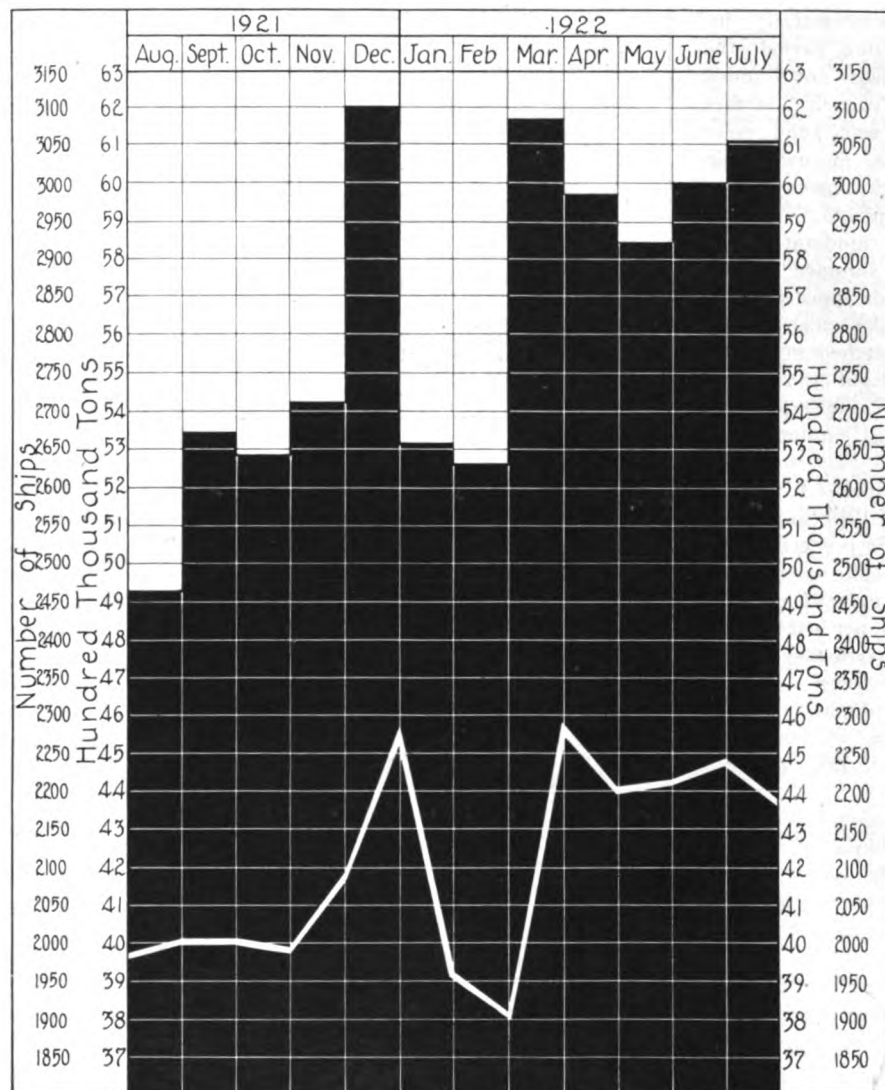
No. 10

Marine Field Out of "Red Ink"

With Ships More Fully Employed and Shipyards
Taking Contracts, Profits Are Replacing Losses

BY R. V. SAWHILL, EDITOR

IMPRESSIONS of the future of the American marine industry have flashed through the spectrum from blue to rosy. And the general trend now is away from discouragement and toward confidence. Any analysis of the controlling factors in the marine field supports this conclusion. The industry was more or less defiant of business rules during the war and government interference after the armistice continued this challenge of economic laws. But now federal meddling has been somewhat curtailed and the marine field is responding naturally to the same conditions which are pulling other American industries out of the depths



TREND LINE SHOWING RECOVERY OF MARINE BUSINESS
This graph, compiled by MARINE REVIEW from its own records of port traffic, shows by the black columns the steady increase in total ship tonnage employed in trade in and out of 18 principal American ports. White line, shows number of ships. Detailed figures are shown on pages 418-19.

of the past depression. The country's foreign trade is regaining some of its old vigor; buyers are in the market for ships; freight rates are stronger; new construction has begun to appear in volume—all of these significant factors show what the men who have their fortunes at stake, think of the chances for profit making. MARINE REVIEW has compiled in the graph at the side, a significant business trend line. Monthly for several years, this business journal has compiled the record of port traffic entering and clearing the 18 major ports of the country. This graph shows by the black pillars, the fluctuations of the total vessel tonnage trading in and out of these

ports during the past year. The white line shows the number of vessels which unite to make up the aggregate tonnage. The steady upward swing in tonnage employed is clear.

Below is a study of the conditions which now affect the present and future of the shipbuilding plants and of the ships. Certain fundamental factors are exerting their influence both away and toward improvement. The analysis shows which tendency is revealing the greater latent power.

Remaking An Industry

Any degree of improvement in the shipbuilding industry furnishes significant evidence of the strength of the shipyards. Those familiar with the war expansion in other fields frequently lose sight of the forced growth of the shipyards under war's call.

Take the steel industry which added 33 1/3 per cent during the full war period, 1914-1918 and only 10 per cent during the 1917-1918 period in which this country was actively involved. During the same period, the rest of the world had not added feverishly to its steel capacity, in fact many plants in the war zone were destroyed, and shifts in ownership after the war held back capacity operations at existing plants. Despite these comparatively moderate additions, the industry slumped badly when war demands disappeared.

In shipbuilding, unlike steel, American expansion was matched in almost every country throughout the world. American expansion was slow in starting, the 1915 ship output being 12 per cent below 1914. In 1916, production had advanced from the 200,000 gross tons of 1914 to 504,000 tons, an increase of 152 per cent; 1917 showed a gain to 998,000 tons or 399 per cent; and 1918 a gain of jump to 3,033,000 tons or 1416 per cent. Yard capacity remained stationary after 1918 but greater efficiency and organized experience brought about a jump in production to 4,075,000 tons in 1919 or a gain of 1937 per cent above prewar.

The term readjustment can not be applied to the remodeling of an industry expanding 2000 per cent to meet a demand which was shut off almost as quickly as it began. American shipbuilding had to be reborn. The bulk of the newer yards simply disappeared, a few had proved their right to existence. The war left a heritage of improved plants, better trained organizations, modern machinery and a fair measure of financial strength which was badly needed to pull through the depression. Like a

Ship Orders Active

MORE shipbuilding contracts have been placed in the past few weeks, continuing the activity commenced early in the summer. New inquiries have not been so active, but of the previous inquiries reported none has been withdrawn and naval architects and engineers are proceeding with plans for vessels on which formal inquiries have not yet appeared.

The following list shows only the new orders placed and inquiries announced during the past month.

SHIP CONTRACTS PLACED

Commercial Pacific Cable Co., supply ship, 169 feet long, 30 feet beam, 15 feet deep, triple expansion engines, two oil-fired Scotch boilers, to cost \$1,000,000 and to be delivered in March, 1923, to Sun Shipbuilding Co., Chester, Pa.

New Orleans, Texas & Mexico railroad, car ferry, 340 feet long, 90-foot beam, 11 feet deep, to Dravo Contracting Co., Pittsburgh.

Wilson Line, two passenger boats for Delaware river service, each 220 feet over all, to Pusey & Jones Co., Wilmington, Del. Philadelphia & Reading railroad, two ferry boats, to Sun Shipbuilding Co., Chester, Pa.

New York Central railroad, three steel tug boats, single screw, oil burners, each 108 feet long, 25 feet 9 inches long, 12 feet 9 inches deep, to Tebo plant of Todd Shipyards Corp., Brooklyn.

Combination freight and passenger vessel, 120 feet long, two diesel engines, designed by Cox & Stevens, to be delivered in November, to Murman Shipbuilding Co., Mobile, Ala.

Ferry steamer for Detroit-Walkerville route to replace ARIEL; will have capacity of 2000 passengers and 45 automobiles; to Great Lakes Engineering Works, Detroit.

SHIP CONTRACTS PENDING

United States Coast Guard service, contemplates two cutters to replace the BEAR and the SEMINOLE.

Army engineers, one steel dipper dredge hull, Charleston Dry Dock & Shipbuilding Co., Inc., low bidder.

small boat riding the crest after a Cape Horn gale, the industry was one moment on top with fair weather and clear vision, the next wallowing in a trough hemmed in closely by apparently unsurmountable walls.

Well, the industry having escaped foundering, is climbing back to safety. The gale of war demand has passed, many of the apprentice crew have been lost, but the men left are better trained and have gained an efficiency which they can match against shipyards anywhere.

Orders Now Being Placed

Take the record of shipyard work compiled by MARINE REVIEW. The September issue revealed 41 contracts placed with American shipyards during the previous month. These contracts involved almost every type of vessel, 4 ocean freighters, 2 oceangoing passenger liners, 2 big lake bulk freighters, 1 tanker, 4 barges, 4 floats, 4 dredges, 1 yacht, 12 scows, 3 tugss, 3 ferryboats and 1 fireboat. This work

was distributed to yards on the Atlantic, Pacific, Great Lakes and Gulf. Its variety and wideness of distribution are far more significant to the firms supplying shipyard and ship equipment than would be a few contracts involving the same sum but representing only several big vessels placed with two or three yards.

And this latent market, developing from a variety of sources, marks the continuance of a demand that began in the spring. Economic students late last year pointed out that the shipbuilding demand would revive since war construction, imposing in its aggregate total tonnage, was spotted. Special types of ships are still badly needed, even though certain standard classes of vessels are afloat in an abundance which should satisfy that portion of the ship market for a long time.

Great Lakes Lead Recovery

The first orders were certain to come on the Great Lakes where construction for lake service had been at a standstill since the war began. Last spring this lake demand crystallized, the buyers finding that yard and material costs had approached bottom.

Lake orders now include 12 ships on the American side and several on the Canadian shores. The American orders are made up of 7 big 13,000-ton bulk freighters, 2 of the largest sized passenger liners, a self-unloader and 2 ferries. And the demand is not checked, since the lake fleet is the world's largest ship group which has not been increased by war time construction.

On salt water, the coastwise and passenger fleets are badly in need of replacements. Several orders have been placed for this type and more are pending. The same record in MARINE REVIEW showed 21 salt water ships pending of which 16 were passengers and 13 of these were ready for bids.

In comparative terms of world ship construction, American yards are showing the effect of this new demand. The rapid drop as the war program was worked out, has been stopped and between April 1 and July 1, American yards showed a small gain of about 10 per cent. The figures are 136,266 gross tons on April 1 and 150,623 gross tons on July 1, a record immensely below the war figures, but satisfyingly comparable with prewar totals. The upward trend after months of precipitous drop is more significant than the actual totals.

And Americans should not forget that all shipyards throughout the

world have undergone a period of expansion, have had a similar period of contraction and in most cases have not yet struck the reviving demand which has started American yards uphill.

Property held by shipowners throughout the world is estimated to be worth now \$6,000,000,000 less than

it was before the depression started 24 months ago. This figure can be visualized by realizing that it is 40 per cent of the net sum spent by the United States to carry on the war. Much of this shrinkage is of course a paper loss, but to many newer companies it tells the story of bankruptcy. Its chief worth rests in proving the

thoroughness with which the inflated war values have been wiped out, leaving world shipping written down to a point where the prospect of earnings becomes immediate rather than remote.

Lloyd's latest figures show that the world now has 33,935 merchant ships, each more than 100 gross tons, and together aggregating 64,370,786 gross

Government Sells Entire Wooden Fleet in One Deal

SALE of the entire remaining wooden fleet, comprising 226 vessels of approximately 835,000 tons built by the Emergency Fleet corporation during the war, was the outstanding event in shipping board activities in September. At a private competitive sale in Washington, in which 10 bidders participated, George D. Perry, a member of the law firm of Lent & Humphrey, San Francisco, purchased the vessels upon his bid of \$750,000.

The vessels cost the government \$300,000,000 to build, close to \$700,000 a ship, besides their aggregate cost of upkeep, but the figure bid, approximately \$3300 each, was \$1200 more than had ever been offered for any one of them previously. Of the 226 vessels, 211 are at Claremont, Va.; 13 at Orange, Tex.; and two at Beaumont, Tex.

Under the terms of sale, the vessels are not to be used as steamers. Mr. Perry, in a written confirma-

tion of his bid, agreed to the terms but did not specify to what purpose the ships would be put. Associated with Mr. Perry in the purchase, is J. J. Tyson of Charles Nelson & Co., San Francisco.

Some time ago 75 wooden hulls were bought by Robert J. McGahie, also representing Pacific coast interests, for \$122,500.

Between July 1, 1921 and Sept. 1 this year, the shipping board has sold 86 steel vessels of a total gross tonnage of 328,566. These are shown in the accompanying table. To July 1 this year the sales involved 47 cargo carriers of 209,713 gross tons; three passenger of 24,676 tons; four barges of 7200 deadweight tons; two sailers of 3909 gross tons; two ocean tugs of 834 tons; and one tanker of 4469 tons. Sales of steel ships since July 1 have disposed of 25 cargo carriers of 70,312 gross tons and two passenger vessels of 14,653 tons.

Steel Ships Sold Between July 1, 1921, and Sept. 1, 1922

STEEL SHIPS SOLD DURING FISCAL YEAR ENDING JUNE 30, 1922

Name	Gross tonnage	Purchaser
Tankers		
City of Freeport...	4469	Steamer Freeport Co.
Passenger		
Northern Pacific...	8225	H. F. Alexander
Columbia	8225	Pacific Steamship Co.
Callao	8226	Robert Dollar Co.
Sailing Vessels		
Arapahoe	2163	Alaska Packers' association
Tonowanda	1746	Columbia River Packers' Association
Barges		
Caneyfork		W. E. Winship
Hermitage		W. E. Winship
Nashville		John W. Sullivan Co.
Old Hickory		W. E. Winship
Ocean-Going Tugs		
Baldrock	405	United States & Bermuda Towing Co.
Bartheny	429	W. G. Coyle Co., Inc.
Cargo		
Absecon	3372	A. H. Bull Steamship Co., Inc.
Arcadia	5453	Pacific Freighters Co.
Bethnor	3482	A. H. Bull Steamship Co., Inc.
Casco	6022	Pacific Freighters Co.
Cathay	7033	Dollar Steamship Line of California
Cottonplant	2333	Pacific States Lumber Co.
Celestial	7030	Dollar Steamship Line of California
Catherine	2139	A. H. Bull Steamship Co., Inc.
City of Brunswick	6368	Wm. McFatrige
Cowiche	2496	California & Oregon Lumber Co.
Craigsmere	2496	Morton Salt Co.
Coverun	2450	Fred J. Gauntlett
Cowboy	2532	Fred J. Gauntlett
Cowee	2507	Fred J. Gauntlett
Corcoran	2153	Baltimore & Carolina Steamship Co.
Eastern Soldier	6749	Luckenbach Steamship Co., Inc.
Eastern Merchant	8150	Luckenbach Steamship Co., Inc.
Eastern Cloud	5828	Garland Steamship Corp.
Eastern Ocean	5868	Garland Steamship Corp.
Eastern Exporter	5766	Garland Steamship Corp.
Eastern Importer	5786	Garland Steamship Corp.
Eastern Trader	8151	Luckenbach Steamship Co., Inc.
Edellyn	8713	Luckenbach Steamship Co., Inc.
Ida	4730	Pacific Freighters Co.
Isonomia	3901	Pacific Freighters Co.
Lake Forney	2624	Hjalmer Buvig
Lake Arthur	1948	Richmond-New York Steamship Co.
Lake Stirling	1948	Richmond-New York Steamship Co.

Name	Gross tonnage	Purchaser
Lake Flournoy	2606	Lone Star Steamship Co., Inc.
Macomet	3482	A. H. Bull Steamship Co., Inc.
Maddequet	3482	A. H. Bull Steamship Co., Inc.
Mandarin	7032	Dollar Steamship Line of California
Marica	8738	Luckenbach Steamship Co., Inc.
Mary	2150	A. H. Bull Steamship Co., Inc.
Mason City	3482	A. H. Bull Steamship Co., Inc.
Oriental	7038	Dollar Steamship Line of California
Pawnee	4471	Pacific Freighters Co.
Penobscot	2496	C. H. Sprague & Son
Pequot	3541	Pacific Freighters Co.
Pinellas	3513	Caroline Co.
Quinnebaug	1631	Thomas, Hy. Gordon Brayfield
Rajah	2264	W. H. Cowley
Seaconnet	3372	C. H. Sprague & Son
Seekonk	5083	Wm. Cramp & Sons Co.
South Bend	8738	Luckenbach Steamship Co., Inc.
W. J. Crosby	2496	North Shore Transit Co.
Yellowstone	6070	Alfred da Comara

STEEL SHIPS SOLD SINCE JULY 1, 1922

Cargo		
Ashbee	3532	New York Shipbuilding Corp.
Costilla	2351	M. & J. Tracy, Inc.
Cote Blanche	2351	M. & J. Tracy, Inc.
Cottonwood	2450	James Davidson
Coulee	2450	James Davidson
Couparle	2450	Los Angeles Shipbuilding & Dry Dock Co.
Courtois	2450	Munson Steamship Line
Coushatta	2469	M. & J. Tracy, Inc.
Covalt	2450	Morton Salt Co.
Covedale	2450	Munson Steamship Line
Covena	2450	Hammond Lumber Co.
Cowan	2450	Los Angeles Shipbuilding & Dry Dock Co.
Cowanshannock	2532	Bethlehem Shipbuilding Corp.
Gov. John Lind	3431	Baltimore Steamship Co.
Jacksonville	3513	New York Shipbuilding Corp.
Lakebridge	1977	E. K. Wood Lumber Co.
Lake Dunmore	2396	Erle M. Leaf
Lake George	2486	James Davidson
Lakeland	2364	M. & J. Tracy, Inc.
Lakeshore	1977	J. J. Haviside
Major Wheeler	3431	Baltimore Steamship Co.
Norma	2648	T. O. Muller & Associates
Tipton	2648	Baltimore & Carolina Steamship Co.
Tunica (ex-German)	4974	American Merchants Shipping & Forwarding Co.
West Caruth	5632	Frank C. Strick & Co., Ltd.
Passenger		
Pocahontas	10352	Edwin H. Duff
Porto Rico	4301	New York & Porto Rico Steamship Co.

tons. This is an increase of 729 ships and 2,396,133 gross tons in the past year and 3099 ships and 15,281,234 gross tons above the 1914 level. The prewar totals were 30,836 ships of 49,089,552 tons. The tonnage increase in the past eight years thus stands at 31 per cent.

In steel steam and motor vessels, the present total stands at 56,802,000 gross tons against 54,158,000 tons a year ago and 42,514,000 tons at the beginning of the war in 1914. The percentage of increase is slightly under 34.

This increase is of course unevenly distributed among the various nations. In the eight years, the American fleet has advanced from 1,837,000 gross tons to 12,506,000 tons; England from 18,877,000 to 19,053,000 tons. Other nations excepting Germany and Greece, showed gains. Against the British increase of 176,000 tons, the American total went up 10,669,000 tons or about 61 times greater. The world's total of steel steam and motor vessels increased 14,288,000 gross tons in the past eight years, the American increase of 10,669,000 tons accounting for 75 per cent of the gain.

Ships Now in Demand

Mere physical possession of an enlarged fleet does not spell marine success. But evidences are multiplying that Americans can be relied upon to maintain much of their new strength on the seas. More sensible study of marine problems is being shown at Washington than at any other time in the previous half century. The Jones act was the most helpful legislation congress has given the marine industry in nearly 100 years. Its success in removing the legislative restrictions which have been fastened on American shipping is not complete but is encouraging.

President Harding is intensely in earnest in his desire to solve the shipping riddle and even in the event subsidy fails to pass the coming short session of congress, White House influence will continue its forceful pressure to get the government out of the marine business, and to make sure at the same time that private capital is not so handicapped in its efforts to compete for world trade as to make doubtful the success of such efforts.

In the commercial as well as the political field, shipping is mending. The deflation process forced out the weaker companies; the government's handling of its big fleet has been steadily brought toward a more economical basis, although still maintaining the inherent and stifling charac-

teristics which government meddling in private business must always entail. The freight markets have recovered from their long downward swing and with the general improvement in world conditions are growing firmer. Ship sales—probably the best barometer of shipping conditions—are more numerous. The government sold only 53 steel ships in the 12 months ended June 30, 1922 but in the next two months sold 27 steel vessels. The intercoastal trade, from which foreign flag ships are barred, has proved an amazingly strong field for freighters

anxious to ignore. Probably the most important weakness in the American marine field is the shortage of banks, exporting merchants and active agents in foreign countries. These must be developed by American business in order that shipping will receive the strong support which has bolstered up English shipping throughout the world. And the war with its industrial expansion, has made the entrance of American business into foreign fields a question of a few years rather than of a half century.

Stronger in Home Trade

American ships continue to carry a fair volume of the country's import and export trade, about 40 per cent against 60 per cent when government-supported ships crowded the ocean, but compared with only 10 per cent before the war.

With the world's idle fleet being slowly called back into service, with freight rates starting up hill from a level 20 per cent higher than the pre-war average (100 base for 1911-13, against 121 comparative index at bottom of drop) with foreign trade, both export and import, decidedly larger than at the beginning of the year, with ships bringing higher purchase prices and with the removal of some of the worst elements of government interference, American shipping finds a promise in the future which has been denied since the recent depression started.



E. G. FISCHER

Former chief of the instrument section of the coast and geodetic survey, who has just retired. In 35 years of service, he gave the government 24 notable inventions, including the famous tide predicting machine.

and steady additions to the fleet have failed to weaken that market.

Although seriously crippled by costly legislative restrictions, some American shipping firms are making a good record in meeting competition for America's foreign trade. The bolstering influence of the shipping board's treasury has kept many American ships in service but private lines have also done well. The Hariman group is one which has added to its fleet and has built up a strong network of passenger and freight services to many parts of the world.

The most encouraging factors in an analysis of American shipping prospects include the actual possession of a fleet of modern ships and of trained organizations, neither of which were at the disposal of this country before the war. In addition, the country's manufacturing capacity has grown beyond its normal domestic market, forcing business men to look for the foreign trade which they were once

Age Limit Takes Inventor from Federal Service

Retirement regulations of the federal government have cost the coast and geodetic survey the services of E. G. Fischer, mechanical engineer and chief of the instrument section of the survey. In his 35 years' service, Mr. Fischer has turned over to the federal government 24 notable inventions and improvements in instruments used by the survey, to say nothing of his marvelous tide-predicting machine.

To a private concern, Mr. Fischer's services would have been worth \$25,000 to \$30,000 a year, plus royalties, according to Col. E. Lester Jones, director of the survey. But because he has reached the age of 70, Mr. Fischer has been compelled to retire, his top salary at the end of 35 years of effort for the survey was \$3000, and his retirement pension does not approximate half of that sum.

The best known of Mr. Fischer's work is his tide-predicting machine, perfected after years of effort and one of the most intricate instruments in the use of the federal government.

Uses Sound To Find Sea Depths

American Navy Develops Instrument Valuable in Navigation,
Chart Making, Cable Laying and Scientific Research

BY DR. H. C. HAYES

DETERMINING the contour of the sea bottom and finding data valuable in cable laying and repairing are two of the features of a device developed by the United States navy and known as the sonic depth finder. The instrument is used in conjunction with other apparatus brought out by the navy in its experiments growing out of the work of combatting submarines during the World war.

While a navy product, the device is expected to serve a valuable purpose in commercial and scientific fields. Contour charts of the sea bottom over the principal trade route will furnish numerous "land marks" that can be used for determining the progress of vessels equipped with this device. The device can also be used to determine the distance of any precipitous shore line as well as the distance to the sea bottom.

An Aid to Science

Because of its ability to determine deep sea contours with ease, accuracy and speed, the sonic depth finder should prove to be particularly useful for surveying cable routes and materially reduce the cost of such installations. By furnishing accurate data for plotting deep sea contours, the sonic depth finder should be of use to science, for such data will doubtless throw considerable light on the origin of earthquakes, will explain why the various ocean currents pursue their particular tortuous courses, and will furnish evidence for testing the accuracy of various theories pertaining to equilibrium of the earth's crust.

The sonic depth finder, through its ability to detect the presence of and distance to reflecting surfaces may be of use in locating coal and oil deposits or subterranean streams and caverns since a reflecting surface always represents a discontinuity in the sound conducting medium. Such deposits or formations form a surface of discontinuity with the overlying rock formation. And in this connection, though at present it seems far fetched, there is a possibility that cracks and blow-holes in large castings may be located by sound apparatus similar in principle to the sonic depth finder. The sonic depth finder is a device for determining the distance to a reflecting surface by means of sound waves. It operates in accordance with the physical law expressed by:

$$\text{Equation 1, } S = I't$$

where S represents the distance traversed

A Complete Study of Submarine Acoustics

BEGINNING in the September, 1921, issue, MARINE REVIEW published a series of three articles on "Safeguarding Navigation by Sound" in which Dr. H. C. Hayes, sound aide, United States navy described the hydrophone and its uses. Since then the navy has completed further developments in this work and Dr. Hayes describes the new device and its uses in the accompanying article. As the instrument is employed with other apparatus explained in the series, the accompanying article may be considered as the fourth number of the group on submarine acoustics.

during the time interval t by a sound wave progressing with a uniform velocity V . The operation of taking a depth sounding consists in sending out a sound signal by means of a submarine sound transmitter of the oscillator or other electrically driven type and determining the time that elapses before the echo of the signal from the sea bottom is heard on the hydrophone receiver. The velocity of sound in sea water multiplied by this time interval gives the distance to the sea bottom and back to the receiver. Therefore, the depth will be equal to half the value of S .

Velocity Is Great

This method of measuring depths, though simple in theory, has proved to be difficult in practice for the reason that the velocity of sound in sea water is so great that a small error in measuring the time interval results in a large error in the determination of the depth. An error of one-fifth of a second results in an error of about 80 fathoms in determining the depth. It is evident that stop watch methods are too inaccurate and too much subject to the personal equation of the observer to serve for measuring the time interval in question. The various laboratory methods for measuring time intervals with a high degree of accuracy require apparatus too delicate to withstand the conditions met with on seagoing vessels and are too complicated to be operated by a ship's personnel. Numerous special devices have been designed for measuring the time

interval between signal and echo but all have proved to be too inaccurate or too complicated to be practical.

Submarine sound transmitters and receivers suitable for this type of depth sounding have been on the market for at least 10 years, but this application to depth sounding has been delayed for want of some simple, rugged device for measuring with great accuracy the time interval involved.

How Time Interval is Found

The simplicity and accuracy of the sonic depth finder is due entirely to the fact that it makes no attempt to measure directly the value of t , the time required for sound to travel to the sea bottom and back again to the surface, but determines this factor as a simple known function of another time interval p that can be measured with great accuracy. The relation between p and t will now be developed. Suppose some automatic means is provided for operating the key of the sound transmitter such that signals are sent out continuously at the end of equal time intervals. Call the time interval between signals p . Then suppose the automatic key to be provided with means for varying continuously the value of p between a maximum and minimum value that are somewhat widely divergent. If the operator is provided with a 2-receiver telephone head set so connected that one phone responds to the transmitted signal and the other phone responds to the echoes from the sea-bottom, then by adjusting the value of p to a proper value the transmitted signal will be heard in one phone at the same instant that an echo is heard in the other phone.

Suppose he has adjusted p such that the sounds in the two phones are coincident. Then if the value of p is of such magnitude that a signal is sent at the instant the echo of the first preceding signal returns, then the value of p and t are the same; but if the value of p is such that the echo of the second or third or n th previous signal is heard at the instant a signal is transmitted, then t equals two, three or n times the value of p respectively. This relation expressed as an equation becomes:

$$\text{Equation 2, } t = np$$

where t is the time interval required for the sound signal to travel to the sea bottom and back again to the surface, p is the time interval between signals, and n is a whole number. If we substitute $2D$

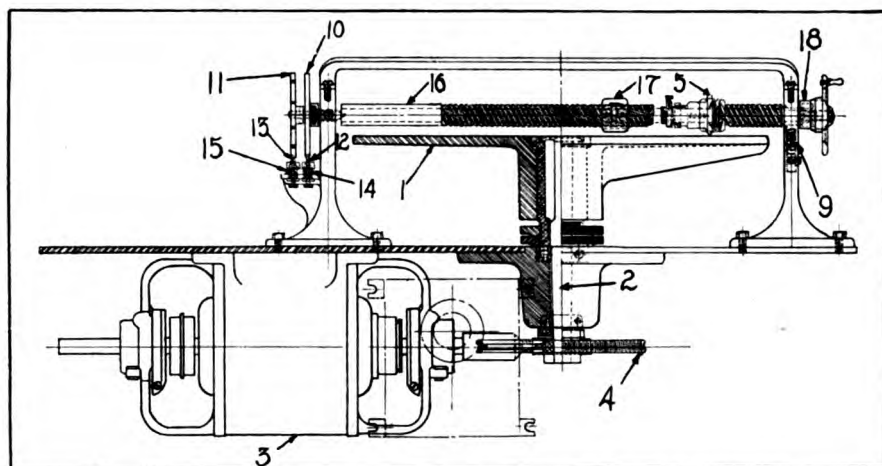


FIG. 1—PRACTICAL DESIGN OF SONIC DEPTH FINDER

for S in equation 1 and for t , the value given in equation 2, we have:

$$\text{Equation 3, } D = \frac{1}{2} V n p,$$

where D is the depth, V the velocity of sound in sea water, p is the time interval between signals, and n is a whole number whose value is not known. Of the three factors on the right hand side of the equation only v is known. It, therefore, becomes necessary to replace both n and p by known or measureable quantities before the value of D can be determined.

The value of p can be expressed in terms of the dimensions and adjustments of the parts of the mechanism employed automatically to operate the key of the sound transmitter. This device may partake of the nature of a pendulum, in which case p will be expressed in terms of the well known pendulum laws. But the device preferred consists of a disk similar to that employed on graphophones driven at constant speed. The top face of the disk forms a friction surface for driving a small wheel that can be moved back and forth radially along the surface of the disk and provided with a scale for determining the distance S from the center of the disk to the point of contact between wheel and disk. Such an arrangement permits of varying the speed of the friction wheel continuously through all values included between zero and a certain maximum determined by the speed and size of the disk and the diameter of the friction wheel. The signaling circuit is closed and opened by means of contact points operated by one or more cam wheels which are rotated by the friction wheel. These cams may carry one or several projections uniformly spaced about the circumference. In case one projection is employed the value of p is equal to Q , the time of rotation of the friction wheel, and if C projections are employed p is equal to Q divided by C .

The scale reading S gives the radius of the circle which the friction wheel scribes on the disk. Call the radius of this wheel r . Also designate the constant period of revolution of the disk as P . Then, since

there is no slip between the disk and friction wheel we have:

$$\text{Equation 4, } \frac{2\pi S}{P} = \frac{2\pi r}{Q} = \frac{2\pi r}{pC}$$

from which we have:

$$\text{Equation 5, } p = \frac{Pr}{CS}$$

and by substituting this value for p in equation 3 we have:

$$\text{Equation 6, } D = \frac{V n P r}{2 C S}$$

in which all the factors on the right hand side are known except n .

The value of n can be determined in terms of the scale readings as may be seen from the following: Suppose the depth finder has been carefully adjusted for coincidence of signals and echoes in the two phones. Let n represent the number of the previous signal whose echo arrives coincident with each outgoing signal and let s_n represent the corresponding scale reading. Now increase the value of S until coincidence between signals and echoes is again restored. Under such conditions the echo of the $n + 1$ previous signal is coincident with the outgoing sig-

nals. Designate the new scale reading by, $s_n + 1$. Then, since D is the same in both cases we have:

$$\text{Equation 7, } \frac{V n P r}{2 C s_n} = \frac{V (n + 1) P r}{2 C s_n + 1}$$

from which we get:

$$\text{Equation 8, } n = \frac{s_n}{s_n + 1 - s_n}$$

and by substituting this value for n in equation 6 we have:

$$\text{Equation 9, } D = \frac{V P r}{2 C (s_n + 1 - s_n)}$$

which will be termed the "sounding equation" and in which D represents the depth, V the velocity of sound in sea water, P the period of revolution of the disk, r the radius of the friction wheel, C the number of teeth on the cam and $s_n + 1 - s_n$ represents the difference in scale readings corresponding to two consecutive adjustments of the friction wheel for coincidence between signals and echoes.

Figs. 1 and 2 show the nature of a practical design of the sonic depth finder as developed at the United States navy engineering experiment station, Annapolis, Md. A disk (1) twenty inches in diameter carrying a vertical axis (2), is driven at the uniform speed of one revolution in ten seconds by means of a dynamotor (3) whose armature shaft carries a worm that engages in gear (4) which is keyed to axis (2) at its lower end. The speed of the motor is maintained constant to within 1/10 of 1 per cent by means of a tuning fork control for varying the load.

The top of disk (1) is covered with canvas or other suitable material for forming a friction surface for driving friction wheel (5). This wheel, which is 2 inches in diameter, engages with shaft (6) by means of a slot and spline arrangement such that member (5) can slide along member (6) but which causes the two members to rotate in unison. The axis of shaft (6) is so mounted that it

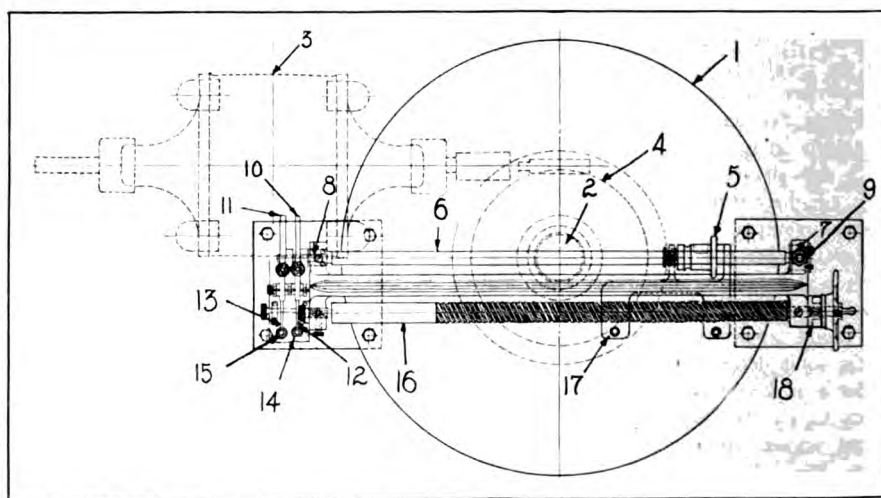


FIG. 2—DEPTH FINDER DEVELOPED BY NAVY ENGINEERS

is parallel with the friction surface of the disk and intersects the axis of pinion (2) extended upward.

Shaft (6) is mounted at each end in self-aligning ball bearings (7) and (8), the former of which is set in a groove such that it can slide a short distance up and down and thereby allow the pressure between members (1) and (5) to be adjusted by varying the tension on spring (9). Shaft (6) carries two cam-shaped disks near the end supported by bearing (8), one of which (10) has a single sawtooth depression and the other (11) carries 10 such depressions uniformly spaced about its perimeter.

Two spring members (12) and (13) bear against the two cam disks (10) and (11) respectively and by snapping down into the depressions as the cams rotate serve to operate the two pairs of contact points (14) or (15) in such a way as to temporarily close the alternating current circuit of a submarine oscillator sound transmitter. Arrangement is provided whereby either spring member may be made to operate against its respective cam but which prevents both members from operating at the same time.

Member (16) which carries a spiral thread engaging in a nut in member (17), serves to move the friction wheel (5) along shaft (6), and measures the radius of the circle which member (5) scribes on member (1) by means of a micrometer scale on cylinder (18). The smallest scale division represents 1/100 of an inch and when it is desired the scale readings can be estimated to 1/1000 of an inch.

Fig. 3 is a schematic diagram showing the electrical circuits employed in the sonic depth finder. Both the dynamotor and the solenoid for driving the tuning fork are connected in parallel across the 125-volt direct current terminals. The speed of the motor can be adjusted to synchronism with the fork by means of the rheostat in the armature circuit. One prong of the tuning fork operates a pair of contact points in series with the circuit that energizes the driving solenoid located between the prongs and serves to keep the fork vibrating. The other prong of the tuning fork operates two pairs of contact points, one on each side of the prong, which serve to close the alternating current output circuit from the dynamotor for a short interval twice during each cycle. This circuit includes one or more lamps for absorbing power and the amount of power absorbed depends upon the electromotive force impressed upon the circuit at the instant the points make contact and this in turn depends upon the phase relation between the fork and the alternating current voltage

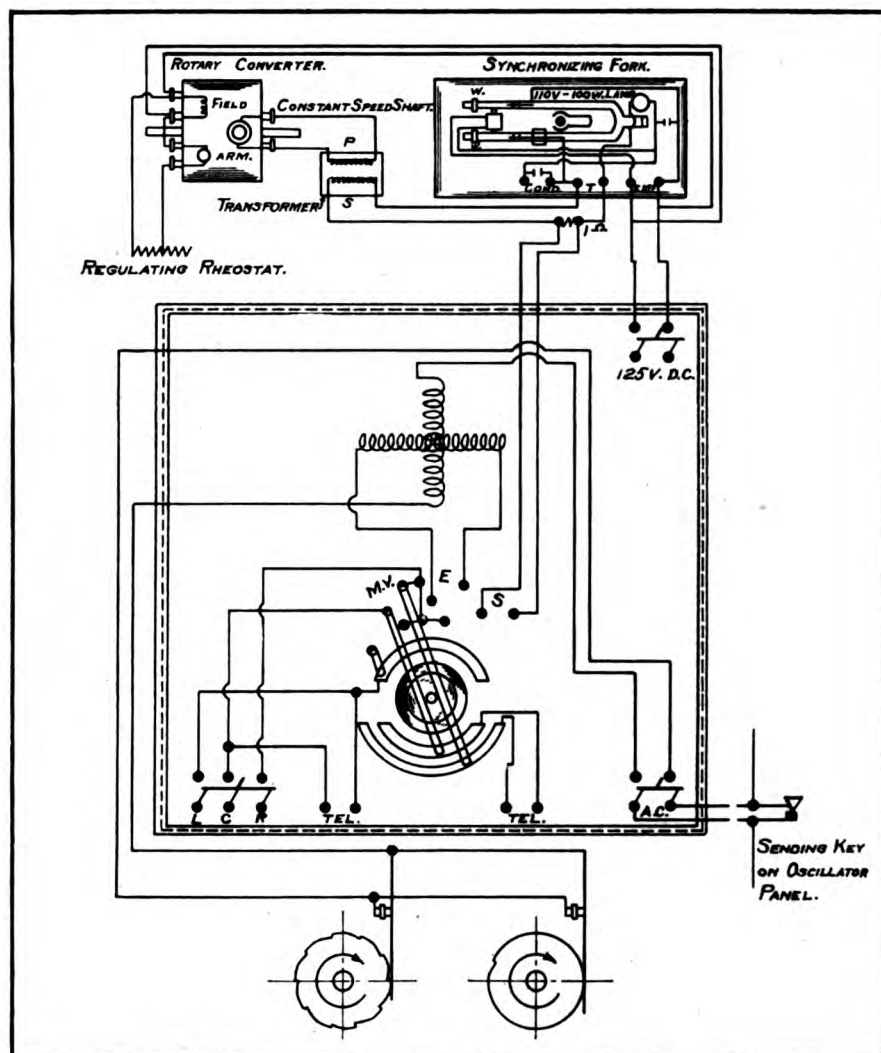


FIG. 3—WIRING DIAGRAM OF DEPTH FINDER

curve. The alternating current circuit for driving the oscillator sound transmitter is carried to the depth finder as a shunt across the hand-operated key on the oscillator switchboard. Within the depth finder this circuit includes the fixed coil of a vario-coupler and the two pairs of contact points (12) and (13) which are operated by cams (10) and (11) respectively.

By means of a double-pole, double-throw switch the right-hand pair of telephone terminals can be connected across a 1-ohm resistance in series in the alternating current circuit of the dynamotor in order that the telephone receiver connected to it may be used for synchronizing this current with the fork; or these terminals can be connected with the alternating current circuit of the oscillator through the vario-coupler which serves for varying the strength of the transmitted signals heard in the telephone receiver connected to this pair of terminals to approximate equality with the echoes as heard in the phone that connects with the hydrophone receiver through the other pair of telephone terminals.

The "sounding equation" when applied

to the practical design just described carries the following values for the various constants:

$$V = 4800 \text{ feet per second.}$$

$$P = 10 \text{ seconds.}$$

$$r = 1 \text{ inch.}$$

$$C = 1 \text{ or } 10.$$

Inserting these values for the corresponding letters for the "sounding equation," we get:

$$D = \frac{24,000}{C. (S_n + 1 - S_n)} \text{ feet}$$

or, since 6 feet equals 1 fathom

$$D = \frac{4000}{C. (S_n + 1 - S_n)} \text{ fathoms}$$

In this equation the maximum value for C and for $S_n + 1 - S_n$ is 10 and, therefore, the minimum depth that can be determined with the apparatus is 40 fathoms. And since $S_n + 1 - S_n$ can have all values between 10 inches and zero this design serves for determining all depths greater than 40 fathoms.

The adjustment of the depth finder for synchronism between signals and echoes can be made with any desired degree of accuracy since any slight deviation from

perfect adjustment will be recognized by a gradually increasing difference in the time of arrival of the signal in one phone and the echo in the other phone. It has been found in practice that the scale adjustment can be made accurate to within 2/1000 or 3/1000 of an inch and such adjustment can be repeated.

It was expected that some error would be introduced by slip between the two friction surfaces, but the power supplied through the friction wheel is slight and no evidence of slip has been detected. The

accuracy, of course, is dependent on the constancy of the period of revolution of the disk. It has been found in practice that the tuning fork regulator keeps this factor accurate to better than 1/10 of 1 per cent.

The accuracy also depends upon the velocity of sound in sea water. This factor is not constant but varies with the temperature, pressure, and salinity of the water. The value 4800 feet per second is a fair average for this factor and the "sounding equation" as given serves well

for determining deep sea contours where differences in depth is of more importance than absolute values. However, if extremely accurate absolute values of the depth is desired the factor V must be corrected to meet the conditions under which the measurements are made. This correction is small in all cases.

The speed of the vessel from which soundings are taken introduces no appreciable error because its speed in all cases is small in comparison with the speed of sound in sea water.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Sept. 8, 1922, on Future Loadings

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	100 lbs.	Finished steel	From North Pacific Ports to	Lumber Per m. ft.
Liverpool.....	1/6	\$0.60	\$0.25	\$0.17	\$0.40	\$0.75	\$7.00T	San Francisco.....	\$6.00 to 6.50
London.....	1/6	0.60	0.25	0.17	0.40	0.75	7.00T	South California.....	7.00 to 7.50
Christiania.....	\$0.20	0.40	0.47½	0.25	0.45	0.50	7.00T	Hawaiian Islands.....	10.50 to 12.00
Copenhagen.....	0.20	0.40	0.47½	0.25	0.45	0.90	7.00T	New Zealand.....	13.00 to 14.00
Hamburg.....	0.12	0.20	0.25	0.17	0.45	0.82½	8.00T	Sydney.....	13.00 to 14.00
Bremen.....	0.12	0.20	0.25	0.17	0.45	0.82½	7.50T	Melbourne-Adelaide.....	15.00 to 16.00
Rotterdam.....	0.12	0.27½	0.37½	0.17	0.40	0.75	4.50T	Oriental Ports.....	10.00 to 12.00
Antwerp.....	0.10	0.27½	0.25	0.17	0.40	0.75	6.50T	Peru-Chile.....	14.00 to 16.00
Havre.....	0.12	0.40	0.27½	0.19	0.40	0.75	9.00T	South Africa.....	20.00
Bordeaux.....	0.12	0.40	0.42½	0.20	0.40	0.75	9.00T	Cuba.....	18.00
Barcelona.....	0.18	0.55	0.35	7.00T	—20.00T—	—	9.00T	United Kingdom.....	90s
Lisbon.....	0.18	0.55	0.75	7.00T	—20.00T—	—	7.00T	United Kingdom (ties)...	70s
Marseilles.....	0.18	0.50	0.40	6.00T	—20.00T—	—	7.00T	Baltimore-Boston range.	13.00 to 15.00
Genoa.....	0.17	0.50	0.40	0.42½	0.50	1.00	8.00T	Baltimore-Boston range.	(ties)..... 12.50 to 14.00
Naples.....	0.17	0.75	0.42½	0.42½	0.50	1.00	9.00T	Buenos Aires.....	17.00
Constantinople.....	0.21	15.00T	0.75	0.25	—20.00T—	—	8.00T	Flour and Wheat	
Alexandria.....	0.21	15.00T	....	0.25	—20.00T—	—	8.00T	Oriental Ports.....	\$ 4.50 to 5.00
Algiers.....	0.22	0.65	....	0.30	—22.00T—	—	12.00T	U. K. and Continent.....	32/6 to 37/6 T
Dakar.....	....	14.50T	....	15.00T	—20.00T—	—	10.00T	Scandinavia.....	40s to 42/6 T
Capetown.....	10.50T	20.00T	....	15.00T	—20.00T—	—	12.50T	Mediterranean.....	40s to 42/6 T
Buenos Aires.....	....	....	....	....	—25.00T—†	—	6.00T †	Steel	
Rio de Janeiro.....	....	....	....	....	—21.00T—†	—	7.00T †	Oriental ports.....	\$5.00T
Pernambuco.....	....	....	....	....	—20.00T—†	—	8.00T †	Cotton	
Havana.....	0.17½*	0.37½*	....	0.17½*	0.47*	0.94*	0.20*	Oriental ports.....	\$10.00T
Vera Cruz.....	....	0.45	....	0.20	0.45	0.90	0.35	Apples	
Valparaiso.....	....	1.07	....	0.70	0.45	0.80	12.00T	United Kingdom.....	\$1.00 per box
San Francisco.....	....	0.40	....	0.56	....	....	0.30	Copper	
Sydney.....	....	....	....	....	20.00 to 25.00	....	11.50	Oriental ports.....	\$4.50 to 5.00
Calcutta.....	....	16.00T	....	....	—16.00T—	—	10.00T		

T—ton.

†Landed.

††Heavy products limited in length.

*Extra charge for wharfage.

Principal Rates To and From United Kingdom

	s	d		s	d
Grain, River Plate to United Kingdom.....	20	0	Coal, South Wales to Buenos Aires.....	13	6
Coal, South Wales to Near East.....	14	0	Iron ore, Bilbao to Middlesbrough.....	6	6
Coal, Newcastle to France.....	5	8	General British market, six months time charters, per ton per month.....	4	6

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
July 8, 1921	\$5.75 @ 6.25	\$1.45	5.25 cents
Oct. 4, 1921	5.85 @ 6.15	1.45	5.25 cents
Jan. 9, 1922	5.50 @ 5.90	1.25	5.50 cents
April 6, 1922	5.30 @ 5.90	1.16½	4.75 cents
July 1, 1922	8.10	1.26½	4.75 cents
Aug. 3, 1922	11.50 @ 11.75	1.45	5.00 cents
Sept. 8, 1922	9.25	1.25	5.00 cents

At Philadelphia

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
July 7, 1921	\$4.90 @ 5.45	\$1.47½	4.5 cents
Oct. 6, 1921	*6.10 @ 6.25	1.80	4.25 cents
Jan. 9, 1922	*5.10 @ 5.35	1.50	5.00 cents
April 10, 1922	*5.90 @ 6.25	1.05	4.25 cents
July 1, 1922	*8.00	1.15	4.25 cents
Aug. 3, 1922	*11.00 @ 11.25	1.47	5.00 cents
Sept. 8, 1922	*9.00	1.47	5.00 cents

*Trimmed in

Other Ports

Boston coal, per ton	\$8.20
Boston oil, f. a. s., per barrel	1.35
Hampton Roads, coal, per ton	9.00
Seattle, coal, per ton	7.50
Cardiff, coal, per ton	225
London, coal, per ton	24s
Antwerp, coal, per ton	24s

Editorial

Americans in Transatlantic Trade

DESPITE the reiteration of leading transatlantic lines that the big, luxurious passenger ships are unprofitable, many still hold the opposite belief. For that reason, some confidence is attracted to the recurring report that American capital may embark upon a plan for constructing big ocean liners.

The report, first appearing a few weeks ago, revolves around the building of two 1000-foot liners of about 70,000 gross tons each. The construction is contingent upon the passage of the subsidy bill and of course public discussion of the plan at this time has been permitted as an aid in the campaign for subsidy.

Chairman A. D. Lasker of the shipping board recently stated officially that the plans for two of these ships are well on toward realization. He said sufficient capital had been secured to insure the project going through. At a cost of \$15,000,000 each, the ships would be worth \$30,000,000 and that much capital was in sight. One financier has offered to subscribe \$5,000,000. The liners would be electrically driven. One quarter of a million has been appropriated for preparation of plans.

Three months ago the interests involved asked the shipping board if funds would be available from the ship construction loan fund provided in the merchant marine act of 1920. This fund is \$25,000,000 and the board gave assurance that the ships, if of approved type, would receive the support of the board.

Ships of this size and with electric drive would be a striking advance in naval architecture. The MAJESTIC and LEVIATHAN are a little more than 900 feet long with gross tonnage around 56,000.

Homier L. Ferguson, president of the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is reputed to be active in the new company. He has previously announced that the Pennsylvania railroad was considering the construction of 1000-foot liners, contingent upon the success of the subsidy campaign. Emphasis is given to this statement by the success of the Canadian Pacific railroad in uniting its rail and water services.

Operating experience in handling large liners has been developed in this country in the past few years. For a long time, few American liners figured in the transatlantic trade, a route in which they were once supreme. The American line operated four older and slower ships, the NEW YORK, PHILADELPHIA, ST. PAUL and ST. LOUIS. Since the war, American service has expanded, principally through the "President" type of liner built by the shipping board and through the ex-German vessels. However, some independent

construction and purchase has been done, notably by the Harriman organization. The shipping board probably will sell shortly its fleet of new liners and the ex-German ships including the great LEVIATHAN now only a few months away from completion.

Whether or not the big 1000-foot liners are built, Americans will figure more prominently in the transatlantic passenger trade than they did before the war when they furnished merely the passengers, not the ships.

Shipping Is Winning Recognition

EFFORTS to "sell" the American merchant marine to American business have never attained results when the arguments rested primarily on patriotic grounds. Business men can not follow their personal inclinations entirely without running the risk of disaster to their enterprises. But patriotism or national feeling is a factor in marine affairs. Even the British merchant with his foreign trading efforts supported by the largest commercial fleet any nation ever possessed, not only gives British ships the preference when conditions are equal but frequently favors them when competitors offer much more attractive terms.

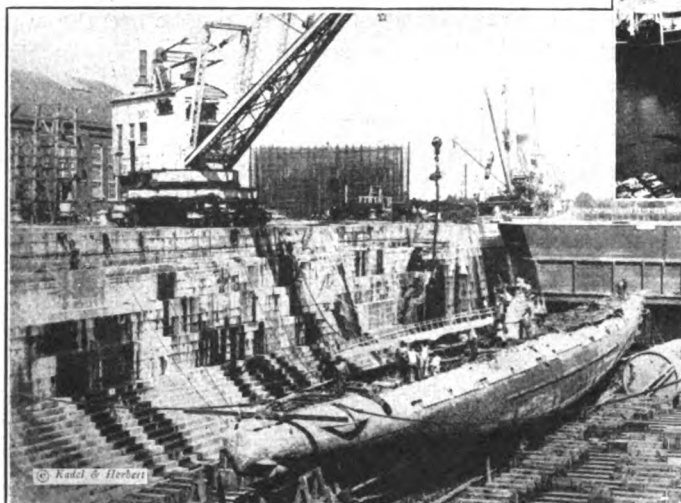
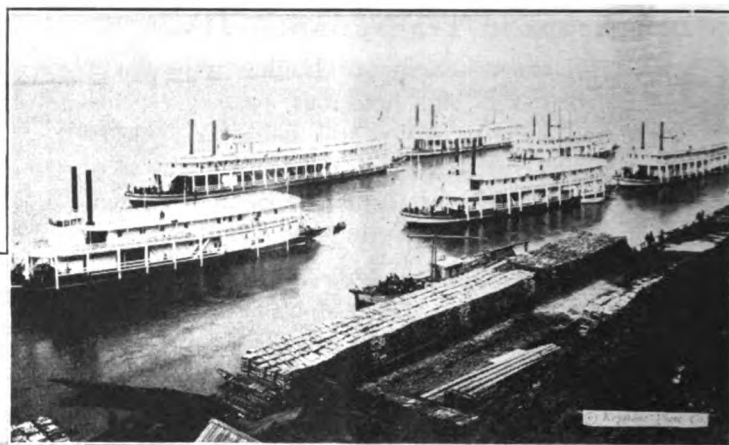
The American business man has been trained for years to rely solely on foreign flag ships, his only recourse since the American ships were overwhelmingly outnumbered. Now conditions have altered so that the new American merchant marine can be "sold" to Americans on commercial as well as patriotic grounds. The number of American ships in deep sea trade, the quality and regularity of service and the equality of rates unite to give the foreign vessels competition for this country's trade which they have not experienced for a half century.

Confirmation of the changing viewpoint is offered by the recent action of the Millers' National Federation. Unanimous support was given to a resolution that "an American merchant marine is fundamentally essential to foreign trade development and that to be dependent on foreign steamship lines for the carriage of American products is economically fatally unsound." All millers are urged "to give preference whenever and wherever possible to American flag steamers, and to disregard occasional slight concessions in rates, designed primarily to obstruct the upbuilding of a permanent American ocean carrying service."

American business had proof of the helpful influence of American ships in the coal movement from English ports. Without the ability to supply its own carriers, this country would have paid greatly increased freight rates.

Photographs from Far and Near

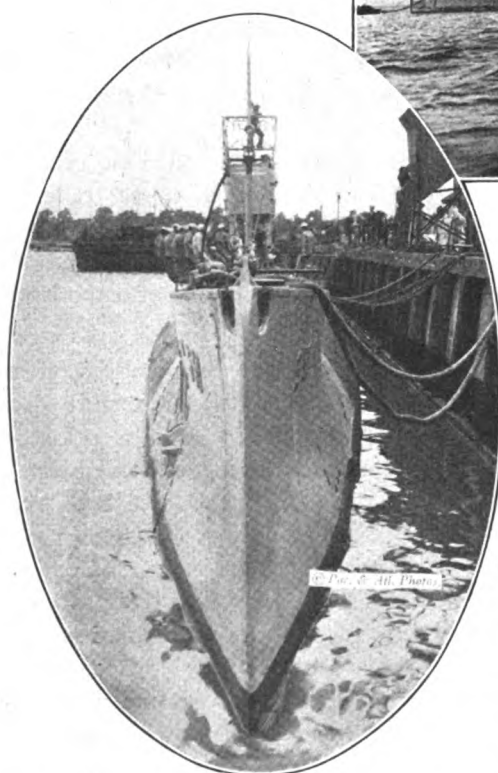
Of the 6000 factories expropriated by the Russian government 4500 in the smaller class have been reconstituted under joint government and private control, capital now being accorded some recognition. All Russia is said to be rejoicing that this release has extended to the steamboats which once plied the Volga and again are running after a long period of idleness. Here they are seen loading at Nizhni-Novgorod, a trade center at the juncture of the Volga and Oka rivers



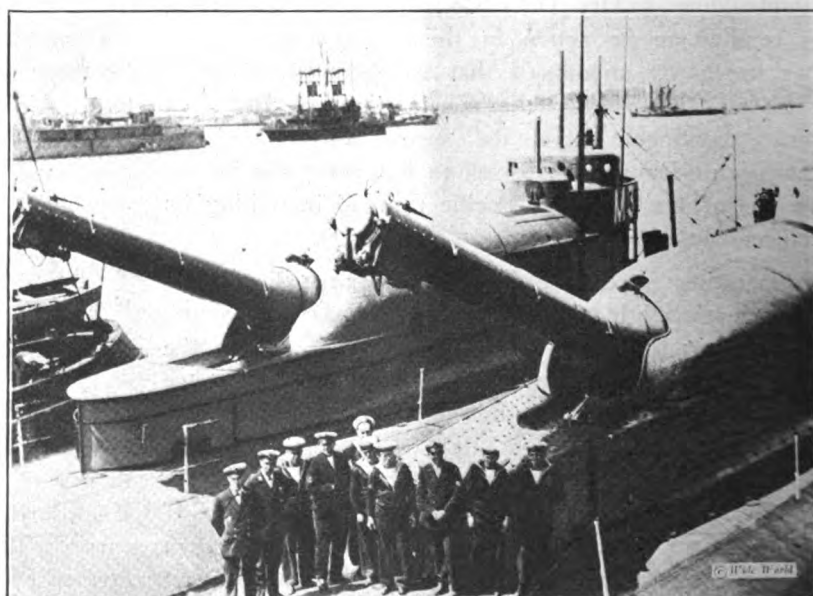
Another contrast is offered in this picture of the German submarine U-III, being "fixed up" in the navy yard drydock, Norfolk, Va., preparatory to her final voyage outside the 3-mile limit, where she was sunk recently in accordance with the treaty of Versailles. She sank in the fall of 1920 in Chesapeake bay, and was salvaged



This is the British navy's latest sea-plane carrier "Ark Royal," photographed at Weymouth. On the fore-castle can be seen two cranes, lowered, which are used to hoist the machines when they alight at sea



Below are the two latest British submarines armed with 12-inch guns. They can be submerged, fully loaded and capable of firing torpedoes, in the shortest time ever attained by British submarines



Another submarine, S-50, the latest built by the United States, is one of the four which cost over \$2,000,000. It is 240 feet long, has five torpedo tubes and three periscopes. It can be submerged in 58 seconds while under full speed

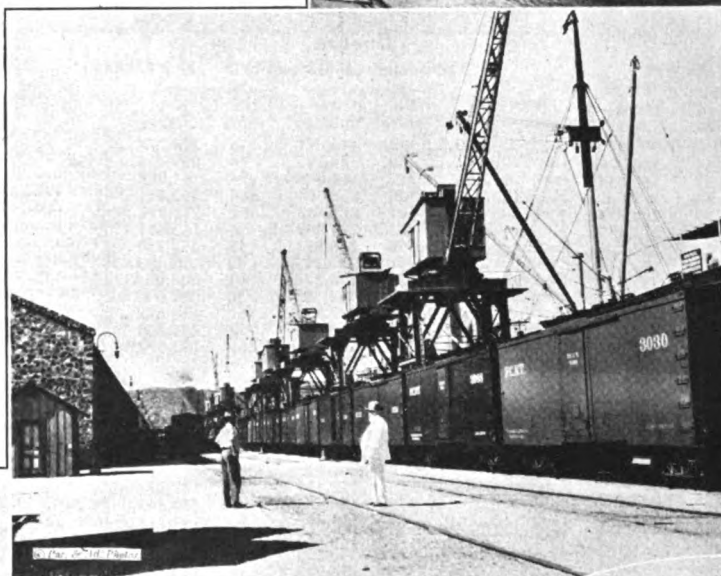
Latest Marine News in Pictures



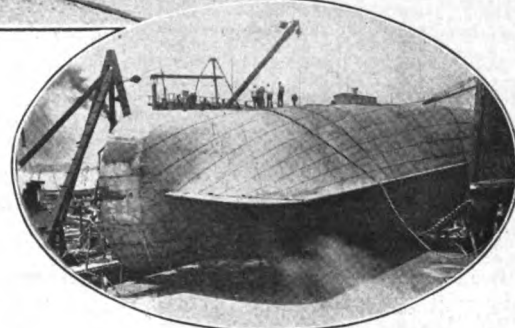
The fact that there are in New York city thousands of people who eat and consider whale meat a delicate luxury calls attention to how extensive is the whaling trade. In England recently 42,000 tons of whale oil was sold at £31 (about \$138) a ton. This picture was taken at the island of South Georgia in the Antarctic, where 1000 whales were caught last year. One of the most valuable products is the whalebone



Many of the Mexican coast cities are equipped as completely and modernly as those in the United States and Europe. Here is a scene at Salina Cruz where loading and unloading are done with electric cranes. Before the opening of the Panama canal a cargo of sugar could be transferred from a boat to train and thence across the isthmus of Tehuantepec and aboard steamer at Coatzacoalcas, within 24 hours



Contrast this Mexican port view with two in the United States. Above are two ships loading with grain at the Erie railroad elevator in Jersey City, N. J., while below are the great lumber docks at Baltimore. Baltimore is growing rapidly as a world trade center for many commodities



A record for quick docking on the Mississippi river was attained recently when the steamer Chagres threatened to founder. She turned over just as tugs managed to get her docked

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	515	1,772,837	508	1,865,798
July	509	1,928,541	520	1,977,690
June	486	1,718,879	551	2,070,048
May	524	1,769,601	496	1,759,780
April	454	1,651,584	473	1,758,160
March	462	1,708,727	484	1,829,016
February	414	1,548,412	391	1,533,163
January	370	1,230,000	396	1,436,614
December, 1921.	398	1,372,663	436	1,604,960
November	423	1,543,430	415	1,506,071
October	413	1,662,564	428	1,644,729
September	385	1,304,544	417	1,556,645
August	478	1,583,991	390	1,300,897

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)				
Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	104	273,123	76	222,478
July	116	307,058	84	248,337
June	103	282,251	83	233,964
May	117	310,117	80	234,220
April	94	245,785	63	197,807
March	107	288,295	79	257,149
February	94	240,663	62	189,140
January	86	243,546	67	211,468
December, 1921.	89	256,660	90	285,894
November	89	249,873	87	252,606
October	86	239,103	67	204,652
September	60	143,434	66	195,558
August	84	208,961	61	144,029

Norfolk and Newport News

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	15	43,887	51	158,879
July	22	62,986	55	158,254
June	22	73,791	56	175,961
May	21	61,513	73	193,599
April	18	59,180	83	232,485
March	29	77,775	79	235,809
February	24	66,156	72	192,640
January	22	78,412	53	152,957
December, 1921.	24	83,609	64	184,012
November	27	84,214	60	171,235
October	23	68,037	59	151,849
September	25	75,836	51	148,987
August	44	134,193	63	173,111

San Francisco

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	507	1,071,981	506	1,038,402
July	499	1,021,517	478	1,000,501
June	483	914,717	486	873,946
May	477	885,753	470	862,712
April	419	796,654	465	895,918
March	418	816,268	446	819,813
February	409	744,590	390	729,773
January	415	797,676	416	759,577
December, 1921.	439	845,793	461	854,595
November	432	791,219	445	869,988
October	445	780,840	454	787,144
September	459	807,276	440	749,911
August	464	770,980	457	788,238

Baltimore

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	110	326,163	106	300,080
July	103	320,104	90	280,394
June	99	280,002	118	333,877
May	117	350,494	103	282,285
April	98	277,582	110	319,103
March	107	323,515	125	362,451
February	93	294,309	103	334,507
January	72	225,800	85	274,080
December, 1921.	95	281,373	102	312,528
November	78	243,934	80	253,943
October	73	249,481	78	252,098
September	85	259,788	81	260,789
August	90	251,499	87	239,482

Seattle

Month	(Inclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	162	396,363	153	387,908
July	140	373,211	137	371,526
June	139	384,290	137	354,702
May	138	357,583	150	361,835
April	129	328,172	154	365,057
March	198	508,760	202	515,606
February	159	478,849	147	417,425
January	174	479,514	177	509,508
December, 1921.	183	528,191	180	517,996
November	177	489,119	166	454,118
October	163	431,637	157	443,447
September	168	434,912	150	387,151
August	202	519,467	192	517,253

New Orleans

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	249	625,819	250	629,150
July	227	570,709	236	601,740
June	253	596,752	234	587,483
May	236	632,495	230	610,916
April	221	565,559	225	594,842
March	235	643,251	258	716,568
February	197	582,189	201	576,973
January	225	621,483	217	603,995
December, 1921.	208	576,354	271	788,172
November	209	533,483	219	600,086
October	177	431,976	176	425,186
September	191	510,646	226	628,057
August	210	478,941	194	482,451

Boston

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	192	449,871	116	203,774
July	159	324,795	94	229,492
June	137	169,015	94	161,888
May	133	251,304	104	192,231
April	71	138,683	103	270,499
March	85	241,289	56	135,671
February	76	218,853	58	153,350
January	70	185,175	42	108,423
December, 1921.	94	239,170	61	134,039
November	62	137,585	80	180,940
October	99	229,800	67	158,695
September	88	197,208	69	144,268
August	100	280,687	63	102,032

Mobile

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	60	112,431	65	137,552
July	79	152,475	73	138,543
June	77	153,357	76	141,413
May	61	109,793	55	114,691
April	61	144,237	62	123,238
March	73	136,937	57	110,363
February	54	122,606	59	117,172
January	71	147,806	64	136,242
December, 1921.	85	194,757	87	216,233
November	87	104,489	47	86,559
October	64	124,089	60	122,949
September	55	95,343	46	89,460
August	57	108,936	48	83,486

Los Angeles

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	52	143,931	43	117,758
July	44	125,139	48	138,275
June	48	109,261	38	90,915
May	47	141,219	55	174,644
April	53	161,709	45	138,927
March	75	172,471	59	139,424
February	76	105,243	63	108,207
January	88	149,622	101	125,795
December, 1921.	94	161,393	81	137,450
November	66	42,054	90	69,275
October	68	124,682	76	123,276
September	54	128,611	45	119,275
August	50	117,775	40	106,243

Key West

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	65	69,962	61	65,883
July	67	80,673	67	85,336
June	60	73,308	58	73,842
May	89	107,629	82	101,318
April	77	81,917	81	86,471
March	97	78,984	92	76,531
February	84	67,080	78	68,137
January	77	69,850	77	72,321
December, 1921.	76	73,276	74	70,169
November	70	79,586	67	78,618
October	55	66,400	59	67,608
September	62	77,229	70	101,948
August	65	69,911	59	66,223

Portland, Me.

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	28	42,746	28	47,459
July	19	39,950	20	39,571
June	11	16,601	15	21,765
May	16	21,380	10	22,477
April	14	51,228	18	62,091
March	23	81,938	20	77,044
February	23	73,634	24	75,625
January	21	64,885	21	67,309
December, 1921.	29	92,777	32	99,527
November	24	37,712	12	16,794
October	13	21,191	8	13,652
September	10	15,345	12	26,224
August	13	17,192	13	14,265

Savannah

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	22	63,662	22	59,974
July	23	66,833	23	61,655
June	11	24,870	20	53,367
May	11	20,536	16	40,181
April	8	20,485	15	42,591
March	6	12,845	19	47,946
February	9	17,568	15	40,622
January	4	11,561	9	23,601
December, 1921.	4	8,876	14	43,281
November	10	19,543	16	44,187
October	6	10,417	13	37,447
September	3	5,152	19	56,024
August	17	33,428	24	55,108

Galveston

Month	(Exclusive of Domestic)		(Clearances—)	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922....	59	180,814	63	203,194
July	52	165,276	50	186,201
June	61	193,016	61	200,957
May	60	196,575	59	200,787
April	64	190,675	63	210,853
March	66	155,728	56	166,298
February	45	134,229	48	138,842
January	53	141,172	65	182,442
December, 1921.	74	220,988	85	255,851
November	77	221,217	70	199,885
October	72	219,001	77	227,982
September	75	214,391	99	295,869
August	104	290,372	126	371,472

Portland, Oreg.

Month	(Exclusive of Domestic)			
	—Entrances—		—Clearances—	
	No. Ships	Net Tonnage	No. Ships	Net Tonnage
August, 1922...	102	256,671	103	259,170
July	95	254,553	88	233,744
June	104	300,517	110	319,637
May	85	226,853	88	230,176
April	89	245,702	90	244,402
March	99	264,306	105	283,361
February	85	232,786	82	220,175
January	85	230,682	90	244,363
December, 1921.	92	266,763	94	279,862
November	89	263,595	92	273,424
October	100	302,941	97	292,067
September	89	238,484	78	234,287
August	91	250,330	91	256,527

Marine Business Statistics Condensed

Port Traffic Record

Houston

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922.....	35	40,503	32	63,281
July	29	30,909	32	73,299
June	38	48,938	36	74,798
May	44	45,108	42	134,046
April	42	61,751	47	98,825
March	48	45,312	40	105,309
February	28	27,173	30	86,028
January	32	53,779	31	92,096
December, 1921...	22	42,359	21	27,001
November	23	30,705	27	46,519
October	17	36,682	16	32,223
September	24	74,633	28	26,929
August	24	15,558	21	58,492

Port Arthur, Tex.

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922...	69	227,941	70	224,654
July	88	296,956	82	270,263
June	81	271,752	87	285,633
May	90	303,623	88	292,595
April	90	282,288	101	313,829
March	91	318,679	87	269,369
February	73	233,148	81	250,138
January	82	261,429	77	261,604
December, 1921...	106	359,401	104	339,605
November	92	286,179	89	263,940
October	93	256,932	89	263,993
September	87	224,944	92	254,039
August	74	193,578	70	167,193

Providence

(Exclusive of Domestic)

Month	—Entrances—		—Clearances—	
	No. ships	Net tonnage	No. ships	Net tonnage
August, 1922...	18	61,741	11	38,649
July	10	19,279	7	22,228
June	10	31,095	7	17,423
May	14	49,985	13	37,000
April	9	24,854	7	31,049
March	12	45,966	8	34,272
February	13	53,367	11	46,372
January	11	46,093	12	50,449
December, 1921...	8	26,053	16	50,847
November	12	50,551	16	59,677
October	13	46,530	10	44,661
September	12	43,665	19	65,515
August	6	19,722	3	13,095

Soo Canal Report

The total movement of freight through the Soo canal in August was 10,285,914 net tons, an increase of 50,824 net tons, when compared with the total movement of 10,235,090 net tons in July. Shipments in August of last year totalled 7,497,876 tons, or 2,788,038 net tons below the record for August of this year. August figures since 1916 are:

	Net tons
August, 1922.....	10,285,914
August, 1921.....	7,497,876
August, 1920.....	12,425,290
August, 1919.....	6,609,961

Record of Traffic Through Panama Canal

	Atlantic to Pacific traffic			Pacific to Atlantic traffic			Total traffic through canal		
	No. of ships	Net tonnage	Tons of cargo	No. of ships	Net tonnage	Tons of cargo	No. of ships	Net tonnage	Tons of cargo
1922									
July	American 52	250,378	246,471	55	272,868	335,154	107	523,246	581,625
	Foreign 76	323,853	295,941	68	280,772	333,534	144	604,625	629,475
	Total 128	574,231	542,412	123	553,640	668,688	251	1,127,871	1,211,100
June	American 57	256,060	269,093	45	205,063	211,373	102	461,123	480,466
	Foreign 78	338,136	317,284	48	171,454	179,728	126	509,590	497,012
	Total 135	594,196	586,377	93	376,517	391,101	228	970,713	977,478
May	American 59	285,265	343,913	49	226,356	264,626	108	511,621	608,539
	Foreign 75	309,448	329,485	60	211,747	220,483	135	521,195	549,968
	Total 134	594,713	673,398	109	438,103	485,109	243	1,032,816	1,158,567
April	American 47	220,055	260,442	48	223,913	238,420	95	443,968	498,462
	Foreign 74	300,633	301,991	61	230,232	245,194	135	530,865	547,585
	Total 121	520,688	562,433	109	454,145	483,614	230	974,833	1,046,047
March	American 57	256,613	239,696	46	215,547	219,569	103	472,160	459,265
	Foreign 81	329,428	342,256	50	174,223	158,568	131	503,651	500,824
	Total 138	586,041	581,952	96	389,770	378,137	234	975,811	960,089
February	American 46	199,564	186,486	42	192,931	193,643	88	392,495	380,129
	Foreign 68	288,441	256,339	56	205,599	201,606	124	494,040	457,945
	Total 114	488,005	442,825	98	398,530	395,249	212	886,535	838,074
January	American 47	208,770	206,633	38	169,575	153,649	85	378,345	360,282
	Foreign 78	304,994	286,958	47	163,177	160,058	125	468,171	447,016
	Total 125	513,764	493,591	85	332,752	313,707	210	846,516	807,298
1921									
December	American 44	198,506	163,744	43	198,528	179,441	87	397,034	343,185
	Foreign 91	377,163	353,366	61	243,047	256,502	152	620,210	609,868
	Total 135	575,669	517,110	104	441,575	435,943	239	1,017,244	953,053
November	American 48	227,644	173,027	36	160,457	182,992	84	388,101	356,019
	Foreign 75	311,373	213,654	63	242,937	285,767	138	554,310	499,421
	Total 123	539,017	386,681	99	403,394	468,759	222	942,411	855,440
October	American 43	201,893	165,942	46	195,968	217,141	89	397,861	383,083
	Foreign 88	369,282	208,495	78	302,411	394,197	166	671,693	602,692
	Total 131	571,175	374,437	124	498,379	611,338	255	1,069,554	985,775
September	American 46	210,031	161,875	41	200,375	222,226	87	410,406	384,101
	Foreign 82	320,603	138,845	52	194,128	231,948	134	514,731	370,793
	Total 128	530,634	300,720	93	394,503	454,174	221	925,137	754,894
August	American 43	148,188	146,159	51	180,346	234,208	94	328,534	380,367
	Foreign 77	339,031	171,811	65	297,711	287,095	142	636,742	458,906
	Total 120	487,219	317,970	116	478,057	521,303	236	965,276	839,273
July	American 36	151,595	103,698	37	169,842	212,523	73	321,437	316,221
	Foreign 69	251,456	154,742	64	237,720	238,019	133	489,176	392,761
	Total 105	403,051	258,440	101	407,562	450,542	206	810,613	708,982

August, 1918.....	12,789,801
August, 1917.....	13,967,108
August, 1916.....	14,031,262

Of the total freight carried in August, 10,053,224 tons were handled through the United States canal, while 232,690 tons passed through the Canadian canal. Figures in detail for 1922 and 1921 are:

EASTBOUND

	To Sept. 1, 1922	To Sept. 1, 1921
Lumber, M. ft. B. M....	142,494	135,662
Flour, barrels	4,319,473	4,450,500
Wheat, bushels	73,234,874	49,631,072
Grain, bushels	66,144,256	52,347,014
Copper, net tons.....	31,497	11,151
Iron ore, net tons.....	25,957,410	15,381,861
Pig iron, net tons.....	248	526
Stone, net tons.....	21,183	15,510
Gen'l merchandise, net tons	258,809	38,168
Passengers, number	24,439	27,259

WESTBOUND

Coal, soft, net tons.....	917,116	9,774,892
Coal, hard, net tons.....	13,152	1,506,439
Iron ore, net tons.....	34,608	.....
Mig. iron and steel, net tons	31,769	16,434
Salt, net tons.....	41,171	29,267
Oil, net tons.....	140,222	237,255
Stone, net tons.....	336,866	278,469
Gen'l merchandise, net tons	351,143	291,078
Passengers, number	24,948	28,549

SUMMARY

Vessel, passages, number.....	10,041	7,646
Regist'd tonnage, net.....	29,763,712	19,116,015
Freight:		
Eastbound, net tons.....	30,676,768	18,694,295
Westbound, net tons.....	1,866,047	12,133,834
Total freight, net tons.....	32,542,815	30,828,129

Lake Michigan Receipts

Receipts of ore at Lake Michigan ports for August were 1,826,977 gross tons, as shown in the following record by ports:

Port	Gross tons
South Chicago, Ill.....	933,164
East Jordan, Mich.....	.....
Boyne City, Mich.....	.....
Milwaukee	16,717
Indiana Harbor, Ind.....	194,088
Gary, Ind.....	683,008
Total	1,826,977

August Ore Shipments

Shipments of iron ore from the Lake Superior district during August totaled 9,016,426 tons. Comparing the figures with these of August, 1921, when shipments were 4,329,158 tons, an increase of 4,687,268 tons is shown. Total shipments to Sept. 1 are 26,309,939 tons. In the corresponding period of last year, 14,748,072 tons were shipped. Detailed shipments by ports are:

Port	August, 1922	To Sept. 1, 1922
Escanaba	900,975	2,505,105
Marquette	465,380	1,314,145
Ashland	1,134,577	3,713,633
Superior	2,338,080	6,703,043
Duluth	2,896,979	8,023,724
Two Harbors	1,280,435	4,050,289
Total	9,016,426	26,309,939
1922 increase	4,687,268	11,561,867

Courtney C. Washington, county engineer at Galveston, Tex., after noting the effects of the experimental sand catching groin at Galveston, declared the beach is building up at a remarkably

rapid rate. The groin is built of concrete piling, extends about 300 feet out into the gulf from the seawall at the foot of Twenty-fourth street and will

be extended to 500 feet. Sand is accumulating on both sides of the groin to such an extent that Mr. Washington believes a system of similar groins will rebuild

the beach to its former state. A cross current of water had carried the sand away to such an extent that efforts to rebuild the beach have become necessary.

Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties—
A Record of Collisions, Wrecks, Fires and Losses

NAME OF VESSEL	DATE	NATURE	PLACE	DAMAGE RESULTING	NAME OF VESSEL	DATE	NATURE	PLACE	DAMAGE RESULTING
Aster	Aug. 9	Grounded	Venice	Damaged	Hartington	Aug. 21	Heavy weather	Sable Island	To deck fittings
Antofagasta	Aug. 17	Storm	Off Chile	Heavy	H. T. Harper	Aug. 10	Collision	N. of Point Arena	Not stated
Arabic	Aug. 22	Disabled	Boston	Steerer trouble	Hallierd	Aug. 26	Grounded	St. John	Not stated
American Legion	Aug. 31	Collision	Buenos Aires	Undamaged	Huron	Sept. 6	Collision	Montreal harbor	Not stated
Azopardo	Aug. 31	Collision	Buenos Aires	Sank	Hatteras	Aug. 24	Not stated	Norfolk	Cargo damaged
Alcor	Aug. 26	Collision	London	To bulwarks					
Andree	Sept. 4	Rough sea	Bilboa	Cargo slightly damaged					
Berengaria	Aug. 14	Struck wreck-age	At sea	Prop. damaged	Itata	Aug. 28	Fire	Off Chilean coast	Sank
Bryn Mawr	Aug. 19	Collision	Near Mackinaw City	Not stated	J. Edward Drake	Aug. 31	Not stated	At sea	Foundered
Bennington	Aug. 20	Ashore, leak.	Seal Island	Slight	Jeska	Sept. 7	Ashore	Sodus Point, Lak. Ont.	Full of water
Bubbles	Aug. 22	Ashore	Off Green Creek	Not stated	J. K. Mitchell	Sept. 3	Struck wrecked str.	Goumet Rock Ledge	Leak, badly
Bethore	Sept. 6	Grounded	Off St. George	Not stated	Kenora	Aug. 23	Fire ashore	Fort William	Starboard bow scorched
Baluchistan	Aug. 29	Ashore	Off White Island	Not stated	Kearsarge	Aug. 25	Fog, ashore	Near Tobermory	Tank punctured
Citta di Messina	Aug. 5	Fire	Mediterranean port	To cargo No. 2 hold					
City of Grand Haven	Aug. 19	Collision	Near Mackinaw City	Stem twisted	Lily	Aug. 21	Struck obstacle	E. of Towanda	Sunk
City of Buffalo	Aug. 21	Disabled	Buffalo	Air pump trouble	Lewis Luckenbach	Aug. 24	Collision	Delaware River	Hole in side
Canadian Pacific RR Ship No. 3	Aug. 23	Fire	Fort William	Destroyed	Lake Strymon	Aug. 19	Fire	N. Carolina coast	To compartment
Charles M. Warner	Aug. 30	Fog, grounded	Lower St. Mary's river	Undamaged	Marion (tug)	Aug. 14	Fire	Albany, NY	Total loss
Cold Harbor	Aug. 24	Grounded	Columbia River	Undamaged	Manitou	Aug. 22	Disabled	Frankfort harbor	Lost wheel
Clara	Aug. 22	Storm	Southern Chilean Coast	Foundered	Mary Hanlon	Aug. 10	Collision	N. of Point Arena	Bow stove in
Cubwood	Aug. 29	Fire	Charleston	Heavy	Maid of Canada	Sept. 4	Collision	Off Halifax	Sank
Corona	Aug. 27	Collision	Savannah	To star-board side	Nika	Aug. 28	Ashore	Vancouver Island	Jettis, cargo
Calvin Austin	Aug. 31	Engine dis.	Off Stratford, Conn	Crank-pin broke	Nellie J. King	Sept. 2	Collision	Off Sambro	Damaged
Canadian Beaver	Sept. 4	Disabled	Barbados	Prop. blade lost	Opland	Aug. 27	Disabled	At sea	Boil. trouble
City of Baltimore	Sept. 6	Sails gone	SW of Bogue Inlet	Waterlogged	Opland	Aug. 29	Collision	Sandy Hook	Port side stove in
Colthraps	Sept. 5	Fire	Pensacola	Almost total loss	Olga	Aug. 17	Storm	Off Chile	Sank
Corinthia	Sept. 2	Collision	Off Sambro	Not stated	Philadelphia	Aug. 23	Fire, breached	Naples	Slight
Coulee	Sept. 1	Explosion	At sea	Bulkhead collapsed	Potomac	Aug. 24	Collision	Windsor	Heavy
						Aug. 29	Collision	Sandy Hook	6 plates damaged
Dorothy L. Brinkman	Aug. 14	Rammed in bridge	St. John river	Slight	President Pierce	Sept. 8	Disabled	New York	Machinery trouble
Detroit	Aug. 24	Collision	Windsor	Not stated	Princess Maquinna	Sept. 7	Struck rock	Vancouver Island	Slight
Donaldson Lighter No. 1	Aug. 19	Turned turtle	Philadelphia	Not stated	President Cleveland	Sept. 1	Grounded	Yangtze River	Slight
Dryden	Sept. 2	Disabled	Cuxhaven	Eng. damaged	Rio Grande	Aug. 25	Fire	Brooklyn	Heavy
Denis	Aug. 24	Grounded	Barbados	Not stated	Robert Luckenbach	Aug. 19	Disabled	Philadelphia	Steerer damaged
E. J. Cobb	Aug. 14	Not stated	Norfolk	Bottom damaged	S. I. H.	Aug. 5	Fog, ashore	Point Au rocks	Total loss
Eastern Guide	Aug. 26	Disabled	At sea	Rudder broke	Sinsinawa	Aug. 13	Ashore	Leghorn	Not stated
Eastern King	Aug. 26	Disabled	St. John	Eng. & boiler dis.	Southwestern Miller	Aug. 24	Collision	Delaware River	Hole in bow
Elfin II	Aug. 29	Ashore	Lewes, Del.	Full of water	Storm King	Aug. 27	Disabled	Gravesend Bay	Fuel heaters dis.
Edmonton	Sept. 6	Collision	Montreal harbor	Damaged	Schoharie	Aug. 28	Lost anch. & chain	New York	Not stated
Elinor H.	Sept. 5	Disabled	Off Mazepa Point	Rudder dis.	Stubbs	Aug. 26	Collision	At sea	Heavy
E. M. Ashley	Aug. 24	Not stated	New York	Sank	St. Paul	Aug. 28	Collision	Cuxhaven	Undamaged
Francet L. Taussig	Aug. 26	Collision	At sea	Lost head-gear	Sartaria	Aug. 25	Fire	At sea	No. 3 hold
France	Aug. 26	Collision	London	Undamaged	Sadie Mack	Sept. 4	Collision	Off Halifax	Not stated
Gen. Garretson	Aug. 31	Fog, grounded	West Neebish channel	Undamaged	Stanwood	Aug. 25	Disabled	S. of Columbia river	Tail shaft broke
Georgina Rolph	Aug. 15	Disabled	At sea	Tail shaft broke	Soconv	Sept. 7	Collision	Off Stapleton	Slight
Grace N. Pendleton	Aug. 19	Rough sea	Near New Haven	Lost sail	Swift eagle	Sept. 7	Collision	Off Stapleton	Slight
Guiniguada	Aug. 26	Grounded	Off Sandy Hook Pt.	Not stated	Titar	Aug. 6	Grounded	Straits of Canso	Considerable
Gulflight	Aug. 27	Hit yacht	Savannah	Not stated	Ultima Esperanza	Aug. 17	Storm	Off Chile	Grounded
Gray	Aug. 29	Grounded	Near Victoria	Taking water	Valparaíso	Aug. 17	Storm	Chile	Dragged
Gulf of Mexico	Aug. 29	Disabled	Off St. George	Slight	Venus II	Aug. 18	Grazed ledge	Cushings Island	Slight
Henriette	July 16	Total wreck	Off Tauroga	Sunk	W. C. Aeneas	Aug. 14	Collision	Hay lake	Slight
Hoover & Mason	Aug. 24	Disabled	Soo	Steerer broke	W. C. Richardson	Aug. 14	Collision	Hay lake	2 plates damaged
Heiden	Aug. 27	Struck obstruction	St. Clair river	To wheel & rudder	Winding Gulf	Aug. 23	Touched bottom	Birds Island Flats	Undamaged
					Wabash	Aug. 28	Grounded	Vancouver Island	Undamaged
					W. J. Patterson	Sept. 1	Fire	Jacksonville	Not stated
					West Hargrave	Aug. 30	Fire	Off Red Hook	Slight
					West Harshaw	Aug. 26	Collision	English waters	Slight

Strikes Slow Marine Insurance

Underwriting Feels Effects of Business Disturbances—New York Board of Trade Opposes Adoption of Hague Rules

STRIKES in the coal and railroad industries and stagnation in the export trade has left the marine insurance market in a dazed condition. The labor disturbances have upset the prediction heard a few months ago that by August conditions in the marine field should be on the road to recovery. At the present time there is not enough business to go around. Practically the only offices busy are those specializing in cotton; the others are hanging on desperately hoping that despite everything conditions will improve. There is still enough inland marine business to keep things going but inland marine premiums must be supplemented by a large volume of ocean business to make marine underwriting worth while.

The disturbance in the coal areas has affected underwriters in various ways, the most important being the delay caused to transportation and the consequent direct loss of business; the exposure of goods in transit to additional hazards and the loss of insurance on coal exports. Coal moving in this direction is being covered, of course, in foreign markets.

Less than the seasonal volume of sugar business has been written owing mainly to the price war which recently was settled. Underwriters had looked forward to a large volume of business on sugar shipments from Cuba but surprisingly little has been written by American underwriters. Grain offers underwriters a ray of hope as it is predicted Europe will be in need of grain from the United States and crop indications are that the farmers will be able to export a large surplus.

Find Hague Rules Opposed

MARINE underwriters, who have been working for the Hague rules, received a jolt when a copy of the report of the traffic committee of the New York board of trade and transportation came into their hands. The report characterizes the Hague rules as misleading and disappointing and goes on record as unalterably opposed to the rules as the basis for bills of lading to be issued by ocean carriers. The report states that the rules permit individual dis-

criminatory provisions for every shipper and shipment made. The report has been forwarded to the committee on merchant marine and fisheries of the house of representatives. In underwriting circles the rules have found a number of advocates and their adoption has been urged by various organizations.

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Against Modified Clause

THE American Institute of Marine Underwriters, which has been considering the requests of shippers, banks and consignees that the River Plate clause be modified, has declined to make any change and has notified its members of its decision. This action has aroused some comment among marine underwriters, not a few of whom consider the action unwise. Many underwriters feel that it would not be a great concession on the part of the institute to modify the clause so that it will cover goods under cover. The clause at the present time furnishes protection for 10 days if the goods are left on lighters or on wharfs in the open but the insurance ceases when the goods are placed under cover. It is predicted that the institute may change its decision on this matter.

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Some Quit, Others Begin

THE past month has been noticeable for more than the usual number of entrants and retirements from the marine underwriting field. The most notable addition to the firms writing marine insurance is that of the North River Insurance Co. of New York, which plans to go into the business in an extensive manner. The North River is an old and well financed fire company and undoubtedly will be a factor in the marine market. A new firm composed of Jesse Spier, president, and C. D. West, vice president of the Trans-Marine Underwriting Agency, has been formed and will act as general marine agents. The most important retirement announced is that of the National Benefit Assurance Co. of London, which is being liquidated. The company encountered financial difficulties last summer due to heavy losses on its marine underwriting. At one time it was reported that the

National Benefit was planning to buy an American company, but nothing ever came of it. Another British company that is winding up its business is the National Marine & Fire Insurance Co., Ltd., of London which was started in 1908 and is a subsidiary of the National Benefit.

A new company which will write inland and ocean marine insurance on cotton cargo in transit is in the process of organization at Harrisburg, Pa. The company will be known as the Cotton Marine Insurance Co. of Harrisburg, has a capital of \$200,000 and a surplus of \$100,000. Those interested in the organization of this company are Mather & Co., marine agents and brokers, and McFadden & Co., cotton brokers.

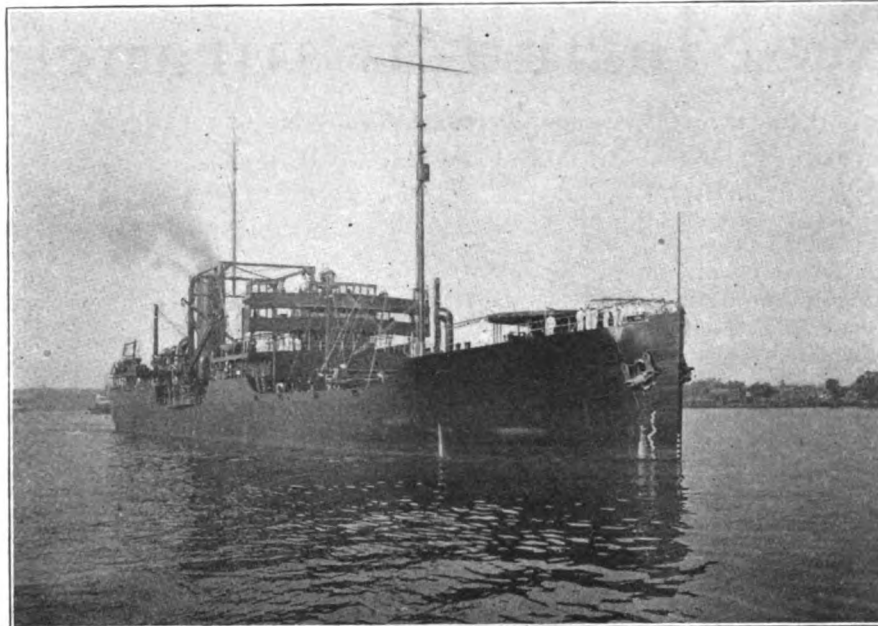
Several marine insurance companies have undergone changes in management. The National Ben Franklin of Pittsburgh has been acquired by the Firemens Insurance Co. of Newark, N. J. Control of the Russia Insurance Co. of America has passed to banking houses which recently offered 48,000 shares to the public. This company does chiefly a reinsurance business but for a short time transacted direct marine insurance. The North River Insurance Co. strengthened its marine insurance facilities by the purchasing of two small New York companies.

The Hansa of Stockholm, an influential marine insurance company, is planning to extend its activities to the United States and has made application to be admitted. It is capitalized at 5,000,000 krona, has a reserve of 1,000,000 krona and total funds of 17,000,000 krona according to the financial statement of the company.

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Oil Pollution, Up Again

THE question of oil pollution has taken on an international aspect and underwriters are much interested in the conference to be held at some future date at which representatives of maritime nations are to gather at the invitation of Secretary of State Hughes to consider ways and means of stopping pollution of waterways with oil. Underwriters are interested in the checking of the pollution of harbors from the fire hazard angle and their organizations



JAPAN'S FIRST ELECTRICALLY DRIVEN WARSHIP

The fuel ship KAMOI left the yard of her builder, the New York Shipbuilding Corp., Camden, N. J., for her trials at the Delaware River breakwater, on Sept. 6. The ship makes 15 knots, has electrical drive, uses General Electric motors and is also fitted with water tube boilers. She has 13,000 tons deadweight displacement and 28-foot draft. On her delivery, she will be a supply ship for fuel oil and coal to naval vessels of the Japanese navy. She will carry a crew of 185. Among the officials of the New York Shipbuilding Corp. making the trip were H. A. Magoun, senior vice president; H. C. Towle, works manager; E. H. Rigg, naval architect; J. B. Crew, engineer; L. Naudain, in charge of electrical work, and C. B. Edwards, assistant to the vice president. Japanese officers included Captain Goto, Captain Murase, Lieut. Com. Furuishi, Lieut. Com. Enya, and Lieut. Com. Kawahigshi.

have been working toward eliminating the danger of harbor fires through local committees. The fact that the question has now been given international recognition is considered a reward for their efforts and underwriting organizations will co-operate.

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Lloyds Has New Plan

OPERATIONS of foreign non-admitted insurance companies in New York state again have come to the front and the hearings which were conducted last year before the insurance commissioner are to be resumed. It is understood on good authority that the hearings will be along a different line than in the past in view of reports from abroad that Lloyds of London has practically decided to stop writing business in New York. The statement was made last year that the Lloyds companies did not care to continue operations illegitimately in this country and if a way could not be found so that they might be admitted they would cease operations. On the surface this looked well; as a matter of fact Lloyds has another plan. Instead of writing business as London Lloyds companies they are seeking an American company, which, if it can be bought at their price, they will buy. Failing to find a company already established, they propose to start an American company of their own. This company, while it will conform

with all the insurance laws, will be financed and managed by representatives of Lloyds and will write the same business as before, only with the difference that it will be within the law. So far, it is said, the interests associated with the foreign companies have not been able to find the company suitable for their needs and satisfactory to their pocketbooks.

U. S. Built Jap Electric Naval Ship in Service

The KAMOI, a 20,000-ton, 8000-horsepower, twin screw fuel ship of the Imperial Japanese navy, and the first vessel of any navy other than the United States to be electrically propelled, successfully completed the builders' trials off the Delaware capes on Sept. 8. For 36 hours, the KAMOI, manned by a crew of the New York Shipbuilding Corp. and a Japanese crew under command of Capt. T. Murase, was put through tests that brought into play every possible stress on all parts of her machinery and equipment.

The electric drive equipment of the KAMOI, designed and installed by the General Electric Co., Schenectady, N. Y., includes the use of synchronous motors for the first time in any twin screw vessel. Tests demonstrated, according to the builder, that the Japanese ship is the most economically operated steam vessel of her size afloat. Her electrical propulsion machinery gives unusual flexibility of control as well as economy of operation, and the mechanical

simplicity of the driving unit affords reliability. While the ship was going ahead at full speed ahead, the propelling machinery was reversed to $\frac{1}{4}$ speed astern in 19 seconds, after which the engines were brought up to full speed astern.

The KAMOI was built in this country instead of in the large shipbuilding yards of Japan in order that the Japanese might study electric drive which has been so highly developed in the United States on commercial and naval vessels.

The main propulsion unit consists of an 8000-horsepower Curtis turbine generator, supplying power to two 4000-horsepower synchronous motors directly driving the twin screw propellers. Two 400-kilowatt direct current turbine generators supply the excitation current as well as power to operate the auxiliaries such as the main circulation pump, main condensate pump, sanitary pump, blower motors, steering gear, radio apparatus, ventilators and lighting equipment.

A 625-kilowatt auxiliary alternator is provided which can be connected to either of the auxiliary turbines in case of the failure of the main driving unit or of any of the auxiliaries. This small generator will supply sufficient power to propel the ship at a speed of about 7 knots.

The vessel is a coal burner, equipped with four Yarrow type boilers which have oil spray boosters attached, to be used when high temperature is desired quickly.

The radio equipment is also of General Electric manufacture, consisting of a 1-kilowatt telephone and telegraph transmitter and two complete receiving sets, one with a range of 250 to 3000 meters and the other from 250 to 30,000 meters. An unusual feature of the telephone installation is five extensions from the radio room connecting with the captain's cabin, engine room and other parts of the ship. By means of this equipment, the captain can remove the receiver from the telephone at any one of five stations and put in a call for the officer of another ship and carry on a conversation by radio much as he might from an office on a land telephone.

The ship has a normal tonnage of 19,500, is 495 feet long and has a beam of 62 feet. She has a draft of 28 feet and a deadweight displacement of 13,000 tons. She will carry approximately 10,000 tons of fuel oil.

Japan has followed America's step in the introduction of the electric drive in its navy, making the first installation in a small ship. The first United States navy vessel to have electric drive was the JUPITER, a collier which has since been converted into an airplane carrier and renamed LANGLEY. Since the first installation, the United States navy has commissioned four electric battleships and has more under construction.

Is Subsidy the Real Solution-II

Economic and Not Political Arguments Should Control
Nation's Decision—Method of Aid Must Be Found

BY ROBERT EDWARDS ANNIN

IN discussing commercial and industrial questions in their relation to national policies, emphasis should be laid on the economic rather than on the political side, if light, rather than heat, is the aim. For on the economic side, discussion may be confined to the merits of the question while, if politics be stressed, the tenets, fortunes, and prejudices of parties at once become involved, when the usual political method of impugning the intelligence or motives of opponents tends rather to confuse than to clarify.

For instance, it is no real argument against a commercial policy that it will benefit some individuals. The question is one of *general* benefit or injury and on this attention should be fixed, ignoring incidental results which are not of vital import. To condemn all government activities from which individuals derive profit would be to paralyze government itself, since it is hard to conceive any government action, from the laying of a tax to the appointment of a postmaster, which will not serve the purposes of some individuals. Particularly is this true of the question of direct government aid to any industry, for in the very nature of things the first benefits accrue directly to private interests, but unless the general benefits are sufficient to offset the general sacrifice, such policies have no political justification.

Some Must Profit

In the case of the proposed subsidy legislation, the fact that certain individuals are to profit must be granted. It cannot be denied. The question is whether these private benefits cannot be excused on the broader ground that they are incidental to policies which will eventually stand self-justified in terms of national interest. Generally in stating the arguments for and against a subsidized merchant marine, those on either side which run to aspersions of motive or intemperance of statement should be omitted in the interest of both lucidity and brevity.

For many years, but especially since Adam Smith published his speculations in his *Wealth of Nations*, economic opinion has generally divided into two well defined and sharply separated schools. One has held that the general prosperity will be best promoted by permitting industry to follow the line of least resistance, unhelped and un-

hindered by governmental interference. This is known as the *laissez faire* theory and broadly applied tends to internationalism, since it looks to the greatest good of all, ignoring national boundaries.

The other school, while admitting *laissez faire* to be the ideal theory, asserts that it is workable only when perfect liberty to all in the production and exchange of goods shall be the prevailing system of nations. Failing that condition, which is now far from realization, they assert that government aid may become vital to the national prosperity for purposes of defense, for the equalizing of natural conditions; preservation of key industries; or protection against hostile foreign legislation. And they contend that for any of these purposes the aid of government is both justifiable and desirable. This school is purely national, and believes that each nation should look after itself first, assuming that its neighbors will do the same.

The average citizen does not usually bother himself much about schools of economic thought, until parties divide along the line of some economic shibboleth. Even then voters are apt to choose their opinions according to their party preferences instead of determining their party affiliations according to their opinions, as the founders of the American republic expected they would.

In the present discussion the subsidists take their position flatfootedly with the nationalists, asserting that our only duty in this matter is to ourselves; that in the coming competition the limited states shall have to meet every economic weapon at the command of its rivals; and that not only prosperity but national safety requires immediate and effective aid to the merchant marine. Stripped of nonessentials, their main argument is based upon the considerations which follow.

There is no need to deny that if left to itself, industry will find for itself the most useful and profitable employment. It is precisely because industry, internationally speaking, has never been left to itself, is not now left to itself, and for a long time to come is not likely to be left to itself, that the question of government aid is now so important.

Under the broad policies which were worked out during the nineteenth century and up to the outbreak of the

world war, all important commercial nations, save one, pursued elaborate policies of aid to private activities for the security and welfare of their own peoples.

Even as regards that one exception, the United Kingdom, the conditions which enabled her to dispense generally with protective measures were established by hundreds of years of fostering care from government, combined with a special situation, political, industrial, and geographical. It was not until near the middle of the last century that Great Britain felt itself in position to dispense with the protection which had surrounded its carrying trade since the days of Queen Elizabeth. With the change in situation caused by the adoption of free trade in commodities, the rise of steam propulsion and metal hulls, and England's growing control of the world's coal trade, general governmental action for the protection of its carrying trade became superfluous.

When England Needed Subsidy

But when, 70 years earlier, the advantage in ship construction and operation lay with the United States, and ships could be built in New England at one third less than in Great Britain, the broad question of a protective policy had a thorough test in the British parliament. Shortly after the loss of the American colonies by the mother country, the younger Pitt introduced into the house of commons a bill providing for practically unrestricted trade, both in merchandising and freighting, between England and the United States. The bill failed of passage; but it is still interesting to consider the arguments alleged against its passage, because of the striking similarity of England's position then, to our position now.

The maintenance of England's maritime supremacy was vital to the nation's safety. The conditions of that supremacy were ships and sailors. To these England must look for the prosperity of the merchant fleet and of the building yards. America was the rival with the greatest natural advantages. To build up America's competition would in a few years jeopardize England's carrying trade, fleet, building yards, and commerce. In place, therefore, of admitting America voluntarily to a share in this business, the policy of exclusion was continued and intensified, until these in-

terests could sustain themselves unaided. Then only was the old policy abandoned. But thereafter whenever special needs for government aid arose, necessary exceptions were made, and the required aid granted. In other words, in the case of England as of other nations, the fostering care of government has been extended whenever and to whatever extent the national interest could be shown and withdrawn only when shown to be superfluous.

Striking Examples of Subsidy

In modern times the two most striking examples of the results of government aid are to be found in France and Germany. France, the less successful, has endeavored to build up its fleet by a system of subsidies begun in 1881 and subsequently frequently modified. To offset the natural and trade advantages of England, the French government offered not only operating, but building and equipment subsidies. While a fair fleet of high class express steamers has resulted, it is admitted that the French expense has been out of all proportion to the results achieved. This however, was due to ill considered laws which were productive of profit to individuals without ensuring for the benefit of the nation the ends at which the legislation was aimed. In so far as these laws have failed, the failure is to be ascribed to this cause.

On the other hand the experience of Germany may be cited as the best example of results that may be achieved by government aid, direct and indirect. It should be borne in mind that in natural advantages and incentives to seafaring, Germany is not to be compared to England, France, or Italy. The coast line is scanty, the ports few and not especially easy of access. The trade outlets in case of war are commanded by Germany's rivals and possible enemies, whether in the North sea, the English channel, or the Mediterranean. Germany's colonial dependencies have been poor and scattered, and comparatively speaking, not lucrative. As compared with the situation of the United States, with its extensive coastwise and lake traffic, protected from foreign competition, and furnishing the most profitable markets, Germany's facilities for building up a merchant marine seemed negligible.

Yet in 1914 Germany occupied the third position on the commercial seas and was still advancing. Not only was its flag seen on every ocean but its manufacturers and products penetrated all markets, pushed by effective co-operation between the government and the banking, manufacturing, trading, and shipping interests.

To justify the belligerency of Great Britain in 1914, it is unnecessary, as it would be untrue, to assert that Eng-

land was not seriously concerned regarding German competition in the export and carrying trade. The trade utterances of the English press and platform are available to prove the contrary. It is also impossible to deny that German progress in that direction, from 1890 to 1914, was due to a most extensive and effective use of protective and discriminative measures, including freights, tariffs, taxes and subventions. Had Germany been able to protect that trade on the high seas, it can hardly be doubted that the nation would have escaped the crushing defeat of 1918.

This notable success of a government aided merchant fleet is conclusive as to the possibilities of that method. It is enough to far more than offset the comparative failure of France's clumsily devised laws to effect the same result. The subsidists extend this part of the argument along these lines, but to estimate its value it need not be followed further.

In a worldwide competition nations carrying natural handicaps must offset and nullify them if private capital is to engage with any hope of permanence. In the world's carrying trade the only practicable offsets are found in the use of such protective measures as the nature of the case permits, including reasonable discrimination against foreign bottoms as well as direct aid to the home fleet. Aid in these forms should be provided for so long as, and to the extent that, experience shall prove necessary. Frequent readjustments should be made to meet changing conditions.

This is proved by the experience of the great maritime nations. It can fairly be asserted that all these, from England to Japan, have habitually afforded such aid as has been necessary to keep their merchant fleet at the strength which their interests have required.

Great Britain is usually cited as an exception. As a matter of fact that nation is the most striking example of this rule. From the time of the Tudors to the time of Queen Victoria, England's position and the world situation required liberal protective aid and the country afforded it. For the 70 years following the repeal of the Corn laws the fleet required little government aid. That little was given. Now that the effects of the war are realized, the resumption of protective action is widely agitated throughout the empire and will surely be resorted to if necessary.

France has pursued the protective policy for 40 years, deeming it essential thus to maintain the flag on the seas. That it has not been more successful is fairly to be attributed to the faulty nature of her maritime laws.

Germany, from 1890 to 1914 matched its inferior situation plus government aid

against England's exceptional resources and entrenched position. Germany's success was such that by 1910 it was commonly remarked that at Germany's rate of progress, two more decades would remove her need for war; Germany would have defeated England without firing a shot.

Therefore it is no longer possible to assume the invulnerability of the *laissez faire* policy which was an economic religion to so many during the reigns of Victoria and Edward VII. England itself is considering protective measures not alone for the merchant marine, but within the year has accepted a law for the "safeguarding of industries" which in all but the name is a protective tariff.

Effort Has Failed

The endeavor to raise the creed of *laissez faire* to the level of a recognized moral principle has thus failed. It must now be considered simply as a policy, since its only distinguished national advocate has publicly abandoned it. Hence all the great nations now publicly announce their adherence either to the principle of governmental aid to national industries or their intention of adopting this policy whenever and to whatever extent national interests may seem to require it.

For the United States, in spite of partisan sound and fury, there has been no tariff bill passed in 70 years which has not been based upon government's right and duty to aid the industries of its own nationals. The only real dispute has been as to the extent to which such aid should be carried; as may be seen by reference not only to the laws themselves but to the debates preceding their passage.

It is therefore not necessary at this stage to hurl dusty Hamiltonian thunderbolts on the one side nor to brandish Jeffersonian lightnings on the other. The question is not one of history or morals, nor of the opinion of this or that father of the republic. What we are discussing is a mere matter of expediency, of measures now suitable to meet altered conditions which confront us as an aftermath of war and of profiting by the solemn warning which that conflict has brought us. Here the subsidist boldly steps from behind his entrenchments and assumes the aggressive. Is it not true, he asks, that the world war has demonstrated that a merchant fleet is essential to America's national security? If this be impossible of denial, as it is, the necessity of prompt action is demonstrated. Then the only question logically remaining is one of detail. How is such a fleet to be maintained as a permanent adjunct of the army and navy. Three methods only emerge here: (a) government ownership and operation; (b) government ownership and private opera-

tion: and (c) private ownership and operation.

Since by common consent of all those whose opinion is of value the experience of the last few years proves the first and second to be no solution, we are thrown back upon the third, private ownership and operation. In other words, we must abandon the hope of the fleet necessary to our safety and prosperity unless private interests will undertake its ownership and operation.

The question then is, can we secure such fleet without government aid? In other words, will private capital engage, unaided, in this business to the extent required by the national situation? Here it is not necessary to go into long comparisons of costs—construction and repairs, overhead and operation. The broad and conclusive answer is given by the history of the American merchant marine from 1855 to 1915, and again from 1920 to 1922. That answer is that against the less hazardous investments and more lucrative shore employments in which this country abounds, American capital *will not, unaided, seriously attempt this enormous venture*. If any one shall require convincing on this point, he may easily be accommodated by perusing the shipping board's record of its recent attempts to dispose of the existing fleet to private interests as well as the history of America's carrying trade in the last half of the last century.

At this point the discussion has justified these conclusions: 1. Our security

and prosperity require an adequate merchant marine; 2. which must be owned and operated by private capital; 3. which cannot be secured except by the promise of government aid. Of these, the war proved the first; a costly experiment proved the second; and the history of the industry, viewed by common sense, leaves no escape from the third.

In this summary, no stress is laid on the argument, which is of much force, that the very existence of America's export trade may depend upon our possession of a fair share of the carrying trade. That is probably, almost certainly, true but, being based on conditions which cannot be absolutely foreseen or predicted, it has not yet reached the point of demonstration.

If the decision be reached that a merchant fleet must be established by government aid, and for the present maintained by the same means, it only remains to formulate and adopt the most efficient and economical policy at command. The word "subsidy" is of evil odor in American nostrils. There is no harm in avoiding the word, provided the necessary help, direct and indirect, be afforded to accomplish the desired result. No form of aid, however stigmatized, is likely to be as wasteful as the experiment in government socialism now so disastrously terminating.

So far as the plans have been disclosed, it is purposed to supply all possible of the required aids by the indirect means of discriminating laws, loans, tax exemp-

tions, preferential rates and co-ordination of rail and water transportation lines. The turning over of the army and navy transport service, the deflection of American immigration into American ships, and the extension of coastwise laws as provided in the Jones act are also relied upon. Only when these have been used to the utmost is it proposed to make good the uncovered deficiency by means of direct subvention, based on tonnage, distance, and speed.

Any of these details are subject to discussion, modification, or even rejection. Once the necessity be admitted and the policy, as such, adopted, there should be little trouble in drafting a law which will make a start along the new lines and which may be modified as conditions may demand, or experience suggest.

Omitting burdensome detail and avoiding heated arguments in support of foregone conclusions, the above is a fair statement of the *basic* argument of the subsidists. The main positions are shrewdly taken and fortified by long experience and the weight of authority. The aim is clearly to force opposition into asserting what cannot be effectively supported or into a position incompatible with national loyalty. It has further the advantage of being concrete and constructive. Therefore a sufficient answer requires either the effective denial of the main premise or a counter proposition offering equal prospects of achieving the desired purpose.

(To be continued)

What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

WHEN the shipbuilding workmen a short time ago induced their employers to withdraw their claim for a reduction of the war bonus by £1 6s 6d and to substitute a reduction of 16 shillings 6 pence in three instalments, the employers made no secret of the fact that they would claim the further 10 shillings at the earliest opportunity. This claim has now been put forward and the Employers' Federation has already had a conference with the representatives of the men's unions concerned with a view to the remaining reduction. The shipbuilders have found no material benefit from the earlier reduction, so far as new orders are concerned, and are becoming impatient in view of the almost complete absence of new business and the increasing success of Germany in competition. According

to the latest reports German shipbuilders have now 1,714,000 tons of new work on hand compared with 600,000 tons last year and 155,000 tons in 1919. Figures have been published lately showing that in Great Britain skilled wages are 55 per cent above those of 1908, the period of the last shipbuilding depression, while semi-skilled wages are more than twice as high and unskilled wages 163 per cent higher. At the present time it is estimated that only 21 per cent of the building berths are occupied by boats on which there is any work to be done.

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THE wages question has cropped up in another way, through the offer of a Glasgow shipbuilder to construct four large cargo steamers, if his men will agree to work at pre-

war rates of wages. It is explained that the company does not wish this to be a precedent and has merely made the proposal in order to ameliorate hardships arising from unemployment. It is considered better for workpeople to get a livelihood at their own trades rather than live on charity. The company has no orders for the ships but would take the chance of disposing of them if they were built. The workers have not yet given their answer to the proposal. It is recognized that, with the cost of living 80 per cent above prewar, some sacrifice would have to be made.

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A PROPOSAL has been made to present to Sir Alfred Booth, until recently chairman of the Cunard Steamship Co., a portrait of himself. A committee has been formed com-

prising leading men in the shipping industry with a view to the presentation of the portrait at a complimentary banquet to be held in the early autumn.

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MOTOR shipbuilding continues to be the most active department of the shipbuilding industry. Of 16 contracts lately placed for motor ships, nine are being built in the United Kingdom. Many believe that the bulk of the orders placed in future will be for ships equipped with internal combustion motors.

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ALTHOUGH Austen Chamberlain has definitely announced the decision of the government to build two new battleships, he has declined to give the dates on which the work is to commence. Several members of parliament representing shipbuilding districts are pressing the government to make a beginning in the interests of their constituents.

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STATISTICS published by Lloyds Register in regard to vessels broken up, lost, condemned, etc., during last year shows that the gross reduction

in the effective mercantile marine of the world amounted to 559 vessels of 674,257 tons, excluding all vessels of less than 100 tons. Of this total 344 vessels of 536,537 tons were steamers and motor vessels and 215 of 137,720 tons were sailing vessels. The figures show that strandings and kindred casualties comprised under the term "wreck" are accountable for 45 per cent of the losses of steamers and 38 per cent of sailing vessels. The amount of tonnage broken up, dismantled, etc., apart from casualty was 93,431 tons.

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DIRECTORS of the Penmark Shipping Co. Ltd., Cardiff, advise the voluntary liquidation of the company chiefly because of the inability to meet the heavy taxation. The estimated profits would not be sufficient to meet the tax based on the average profits of the past three years.

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ALARGE oil tank steamer which is being built for the British Tanker Co., Ltd., London, was launched by Swan, Hunter & Wigham Richardson, Ltd., from their Neptune shipyard, Newcastle-on-Tyne, England, in August. The steamer which is designed to carry more than

10,000 tons of oil, is about 455 feet in length and 57 feet beam.

The propelling machinery is also being constructed by Swan, Hunter & Wigham Richardson, Ltd., at their Neptune Engine works, and will consist of a set of turbines of the Metropolitan-Vickers Rateau type, with double reduction gearing of the three box, floating frame type. Steam will be supplied by three large boilers fitted with Howden's system of forced draft, and burning oil fuel on the Wallsend-Howden system. The principal engine room auxiliaries will be electrically driven.

The vessel herself will be fitted with the most modern appliances for her intended service, including wireless telegraphy, complete electrical installation, Hele-Shaw steering gear and refrigerating machine for provisions.

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SOME revival of shipbuilding in Belfast is reported, instructions having been received to begin building an Atlantic Transport liner of 17,000 tons and to resume work on two large oil tankers. Resumption of other suspended work is likely in the next few weeks. In the depression the number of men employed in Belfast has fallen from 30,000 to 20,000.

New Italian Liner Placed in Service

SERVICE between New York and Naples and Genoa has been augmented by the placing in service of the Italian General Navigation Co.'s new steamship GIULIO CESARE of 21,700 gross tons. With a speed of 20 knots, the liner is scheduled to make the transatlantic voyage in nine days. She is 636 feet long, 75 feet wide and 96 feet deep, equipped with four turbine engines rated to transmit 23,000 horsepower to four propellers. The vessel has eight decks with accommodations for 300 passengers first class, 300 second and 1900 third.

Saloon passengers will occupy quarters decorated in the style of Louis XVI and in that of the directoire period. The ballroom and dining salon, hall and galleries in the aft part of the ship are in Louis XVI period. Those in the forepart are in the directoire period. Private apartments and bedrooms are similarly decorated. The children's room is in Dutch and the smoking room in Jacobean style. The grand lounge, measuring 59 x 43 feet, with a height at the center of about 23 feet, is done in the style of Louis XIV. The walls are covered with valuable tapestries. Two crystal doors divide the central vestibule from the two galleries, the latter being in the regency period, and has shelves for an extensive library. The ballroom occupies

an area of more than 2000 square feet.

Open air promenade decks run without a break for a distance of nearly a mile. They are protected for the most of their length by glass enclosed verandas. Among the amusements and conveniences provided are a gymnasium and rooms for games; hairdressing salons, a perfumery shop, tailors and dressmakers, a "street" of shops installed by first class houses, a photographer, laundry, and a florist with constant supplies of fresh flowers from the vessel's own conservatory.

The rolling of the ship, already reduced by the width is almost eliminated by a system of antirolling compartments. The builders have followed or exceeded the recommendations of the conference of London for saving life at sea. There are 17 water-tight bulkheads, insuring the ship's seaworthiness, even though its floating power should be damaged by 40 per cent. Double bottoms over the entire length are provided. Fireproof bulkheads have been devised which isolate danger of fire by metal roller shutters operated automatically from the bridge. The wireless telegraphy equipment can be operated either by dynamo in the engine room or by a reserve dynamo on one of the upper decks. In addition there

is a complete installation of submarine signals which indicate the approach of other vessels or the nearness of land in case of fog. Life boats have sufficient capacity to carry the entire ship's company of 3000 persons.

Smaller Dutch Shipyards Fail as Orders Drop

Failures among shipbuilders in the Netherlands during the current year have been in a comparatively large number, according to Consul General Anderson at Rotterdam. The situation is not improving, he points out in a dispatch to the department of commerce, the embarrassments being particularly numerous among the smaller companies and those in the north of Holland.

With the coming of the war and the resulting shipbuilding boom, Dutch shipyards enlarged their capacity and devoted themselves largely to the construction of medium-sized ocean going vessels. Tonnage was built for Norwegian, Swedish, Danish, and English owners, as well as for the Dutch. A considerable part of the domestic business was for account of the yards, rather than on contract. When the collapse came, therefore, most of the yards

found their ways filled with vessels constructed of high priced materials at high wages and interest charges, for which there was no sale, Consul Anderson says. Before the war a large trade consisted in the construction of smaller seagoing vessels of the fishing and tug types, and especially of barges for the Rhine and the canal system of Holland. Some of these vessels reached a considerable size, Rhine barges running as high as 3500 deadweight tons. The yards were generally prosperous,

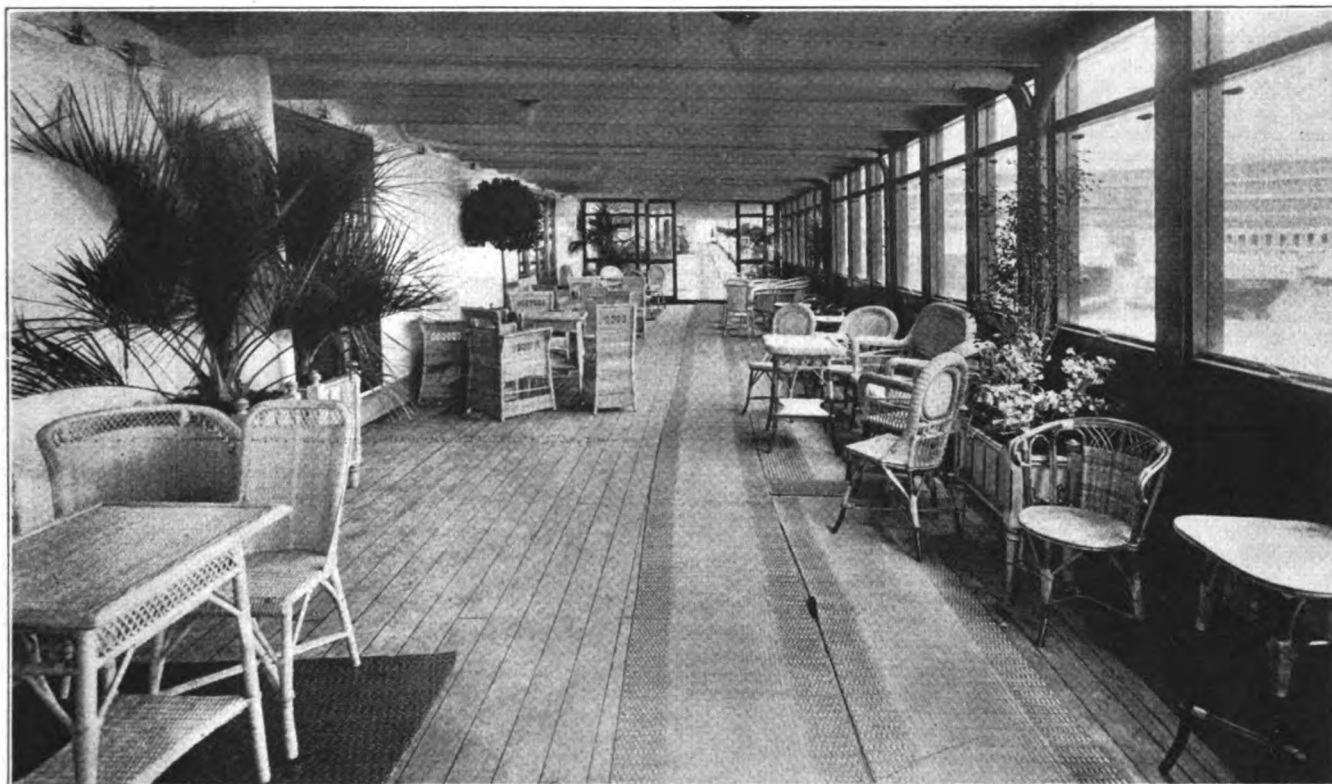
5,400 tons in 1913. Dutch yards have never been able to meet the demand for all the tonnage of the largest and finest vessels required by Dutch shipping companies, and at the end of 1921 there were under construction or on order for Dutch account in foreign yards a total tonnage of 150,075, as compared with 272,000 tons in 1920.

The status of Dutch shipbuilding from 1901 to 1921, shows a steady increase in construction up to 1919, since when the decline has been marked. The tonnage

000,000. The FRANCE was equipped with twelve 12-inch guns, twenty-two 5½-inch, four 3-pounders and four torpedo tubes.

Builds Caisson for Thames Drydock

A floating caisson built to the order of the port of London authority for its dry dock at Millwall Docks, was successfully launched by Swan, Hunter & Wig-ham Richardson Ltd., from its Wall-



PROMENADE DECK ON SPLENDID NEW ITALIAN LINER GIULIO CESARE

and the volume of tonnage turned out was surprisingly large, the consul adds.

Competition from German yards has added to the embarrassment of the smaller Dutch shipyards by taking most of the business of constructing Rhine barges. The comparatively high cost of materials and labor has rendered the construction of barges for the Dutch canal traffic unprofitable. The position of the large yards, though less serious, is not satisfactory, according to Mr. Anderson. Most of them kept in operation during 1921, when the output was the largest in the history of the country, reaching a total of 98 ships aggregating 232,402 tons and representing an increase in tonnage of more than 100 per cent over 1913. These figures are exclusive of inland shipping. Of the ships launched in 1921, 13, averaging 6230 tons each, were fitted with turbine engines, and 12,500 tons were in motorships.

Of the tonnage reported for 1921, 41,740 tons were for foreign account as compared with 114,450 tons in 1919 and

building and orders has been as follows:

On Dec. 31	Merchant ships, gross displacement, tons	War ships, lifting capacity, tons	Dry docks, capacity, tons
1901.....	33,700	....	....
1911.....	128,400	4,390	14,000
1912.....	158,050	3,330	14,000
1913.....	172,050	3,320	13,000
1914.....	185,000	5,420	13,000
1915.....	406,045	22,135	....
1916.....	406,045	21,350	....
1917.....	420,650	33,800	....
1918.....	447,850	33,770	....
1919.....	745,000	26,175	....
1920.....	561,035	25,355	....
1921.....	372,640	26,020	45,000

French Dreadnought Lost

Striking a rock in Quiberon bay, off the coast of France, the French battleship FRANCE late in August capsized and sank. The vessel, built in 1912, was of the French dreadnought type and was in service during the world war. She had a normal displacement of 23,120 tons, was 544 feet in length, 88 feet 6 inches in beam and had a speed of 20 knots an hour. Built and armed, she cost \$12.-

send, England, shipyard during August.

Divided by two watertight decks and two watertight bulkheads into five chambers, the caisson is sunk to close the dock entrance by filling the scuttle tanks in the air chamber, the top and bottom of which are formed by the two watertight decks. Water is blown out of the scuttle tanks by means of compressed air, when the caisson is required to be raised for the purpose of opening the dock entrance.

To facilitate the launching, the caisson was built on its side and subsequently uprighted, the necessary permanent ballast being added to keep it upright.

The length of the caisson, designed to float at a draft of about 19 feet 10 inches, is approximately 68 feet 10 inches, breadth 20 feet 10 inches, and the depth 32 feet 8 inches, each dimension being a maximum.

Work has been begun to dredge the channel at Gulfport, Miss., to a depth of 23 feet at mean low tide.

Activities in the Marine Field

Latest News from Ships and Shipyards

Ships Lose Time Waiting Lake Revival

BY M. L. FEISER

IN the middle of September, car shortage was practically the only deterrent to an active close of a backward shipping season on the Great Lakes. Settlement of the shopmen's strike on the larger railroads of the country bids fair to afford relief in that quarter. With heavy grain, ore and coal tonnages still unmoved, hopes continue high among vessel operators for a profitable few weeks operations.

Coal shipments from lower lake ports on Sept. 4 amounted to only 5,337,000 tons, or nearly 11,000,000 tons behind the tonnage moved at the same time a year ago. Approximately 20,000,000 tons still remained to be hauled to the Northwest and the government, the railroads and the lake carriers were making every effort to move the fuel. In the week to Sept. 2, 432,281 tons of coal were moved, the best week of the season but this was only one third of the rate required to meet the year's demands.

Diversion of open top cars earlier in the season had resulted in slowing down the movement of ore from lower lake docks to furnaces and, therefore, a congested condition at the docks. This in turn slowed the movement of ore from the head of the lakes. With a temporary lull in grain business and inability to get coal cargoes, carriers for a while were marking time, some of the barges being withdrawn from service and laid up. Ore shipments on Sept. 1 reached 26,309,939 tons for the season, as compared with 14,748,072 tons on the same date last year and 22,300,726 tons for the entire 1921 season.

The Erie & Western Transportation Co.'s 1,000,000-bushel elevator at Erie, has been taken over by the Export Grain Corp. under a lease, terms of which provided for shipment of 8,000,000 bushels of grain annually to Erie.

Up to Sept. 1, only two storage cargoes of coal had been loaded on boats at Buffalo this season. These totaled 19,500 and were loaded into the steamers J. P. REISS and PETER REISS. At the same time last year, coal shipments from Buffalo by boat were 2,678,651 tons.

Capt. J. W. Duncan has been appointed master of the steamer W. J. CROSBY of the Northshore Transportation Co.'s fleet at Port Huron. Captain Duncan formerly was master of the barge GEORGE B. OWEN and succeeds Capt. Frank Elliott, of Detroit, resigned.

Capt. Edward Shaw, master of the steamer COLONIAL, has been appointed United States inspector of steamboats in the Pittsburgh district. Captain Banker

succeeds him as master of the COLONIAL. Captain Shaw formerly was assistant inspector at Cleveland.

The steamer C. F. BIELMAN of the Reid Wrecking Co., Port Huron, has been chartered by the Nicholson Transit Co., Detroit, to carry automobiles in conjunction with the steamers ROUMANIA and FELLOWCRAFT.

To be ready for service Sept. 25, the new self-unloading steamer JOHN A. KLING, of the Rockport Steamship Co., will be commanded by Capt. John E. Bufton and her chief engineer will be R. A. Batens. Both formerly were in charge of the CALCITE.

The steamer FRANK E. KIRBY, of Detroit, has been recommissioned to carry the year's fruit crop, traversing the route she followed for many years up to 1919. She was placed in service this year when the services of a large vessel were required.

A record cargo of grain for the Buffalo port arrived there recently aboard the steamer SCHOONMAKER. She had aboard 514,000 bushels of rye, equivalent to 480,000 bushels of wheat. The largest wheat cargo previously received at Buffalo was 476,000 bushels of wheat.

Fire recently destroyed the freight ship No. 3 of the Canadian Pacific railroad fleet at Fort William. The damage was placed at \$150,000. The steamer KENORA, unloading at the dock, was scorched before her lines could be cast off.

The United States lake survey reports the monthly mean stages of

the Great Lakes for the month of August, 1922, as follows:

Lakes	Feet above mean sea level
	July August
Superior	602.49 602.63
Michigan-Huron	580.57 580.56
St. Clair	575.42 575.33
Erie	572.76 572.50
Ontario	246.92 246.56

Lake Superior is 0.14 foot higher than last month, 0.14 foot lower than a year ago, 0.09 foot below the average stage of August of the last 10 years, 1.30 feet below the high stage of August, 1876, and 1.03 feet above the low stage of August, 1879.

Lakes Michigan-Huron are 0.11 foot lower than last month, 0.38 foot higher than a year ago, 0.40 foot below the average stage of August of the last 10 years, 2.95 feet below the high stage of August, 1876, and 0.71 foot above the low stage of August, 1911. During the last 10 years the August level has averaged 0.1 foot lower than the July level, and 0.2 foot higher than the September level.

Lake Erie is 0.26 foot lower than last month, 0.01 foot higher than a year ago, 0.28 foot below the average stage of August of the last 10 years, 1.61 feet below the high stage of August, 1876, and 1.12 feet above the low stage of August, 1895. During the last 10 years the August level has averaged 0.2 foot lower than the July level, and 0.3 foot higher than the September level.

Lake Ontario is 0.36 foot lower than last month, 0.63 foot higher than a year ago, 0.02 foot below the average stage of August of the last 10 years, 1.70 feet below the high stage of August, 1862, and 2.21 feet above the low stage of August, 1895.

From the Northwest

ALASKA salt herring continues to move into Seattle in heavy volume. It is immediately shipped to New York markets and buyers from 15 New York houses have established headquarters in Seattle. In one week ships brought down 10,000 barrels valued at \$165,000. The Alaska boats are also bringing down this year's salmon pack, which is about 25 per cent heavier than last year.

Steps have been taken by Seattle business men to establish a fur ex-

change so that the Alaska pelts now going to eastern centers will be stored and handled from there.

A channel 5500 feet long, 300 feet wide and 44 feet deep from Puget sound to the Great Northern bridge and a channel 900 feet long and 150 to 200 feet wide of the same depth between the bridge and the locks will be dredged this year, at Seattle at an estimated cost of \$446,000. The work will require the removal of approximately 1,000,000 cubic yards of material. The canal and locks con-

nect Seattle's salt and fresh water harbors and the rapidly increasing business through the locks requires this improvement.

Recent heavy bookings of wheat, flour and cereal grains for export to China and Japan indicate a large movement of these commodities across the Pacific in the next several months. Much of the available cargo space in the various liners of the services out of Seattle has been booked ahead for wheat and wheat products.

For the 12 months ending June 30, 1922, a total of 14,248 passengers, who originated in the United States, departed from North Pacific ports for Japan, China and Manila. Of this number 56 per cent went from Seattle. Fifty-five per cent of the total number of passengers using the North Pacific route were destined to China, 40 per cent to Japan and 5 per cent to Manila.

Of the total import and export cargo tonnage entered into and cleared from the United States in the last fiscal year 52 per cent was carried in American bottoms and 48 per cent in foreign bottoms. The shipping board has signified it is satisfied with this division. Seattle divided its export cargo 52 per cent to American bottoms and 48 per cent to foreign bottoms, or exactly the same division as the United States as a whole. Seattle divided its import cargo tonnage 58 per cent American and 42 per cent foreign.

Approximately one million boxes of Washington apples and close to 300,000 additional boxes from Oregon will be handled at the refrigerator terminals of the Port of Seattle this season. Last year close to 250,000 boxes of apples were handled by the port. It was more or less of an experiment, for the coming of refrigerator-equipped steamships in both the north European and intercoastal traffic first made it possible to experiment with fresh Washington fruits.

Steaming from New York to San Francisco in slightly more than 12 days the Pacific Mail liner *PRESIDENT TAFT* has established a new intercoastal speed record. The best previous performance was that of the steamship *H. F. ALEXANDER* which covered the route in 13 days.

After having been held as a prize of war since June 1916, when she was seized by a British Columbia cruiser, the schooner *LEONOR* is to be sold at Victoria to cover the expenses of maintenance during that period. The vessel was owned by a firm at Guayamas, Mexico, and was suspected of operating illegally. The courts finally decided the *LEONOR* might be returned to the owners as the British case had not been proved. However, the owners were unable to pay the \$6000 charged against the craft and she will be sold to meet this obligation.

The schooner *ROBERT R. HIND* is the first cargo vessel fixed on the co-operative plan in the annals of Pacific shipping. She will carry a cargo of lumber from Puget Sound to Australia. Owing

to the extremely low rates offering the owners were unwilling to send the ship to sea but a crew was signed willing to work on the basis of sharing in the possible profits. This venture is an experiment which may help to solve the problem of how to operate sailing vessels under present low freights. The *ROBERT R. HIND* registers 520 tons net and has a capacity for 700,000 feet of lumber.

The Sun Shipbuilding Co., Chester, Pa. and Todd Dry Dock & Construction Corp., Tacoma, were the two lowest bidders for building a dredge for Grays Harbor, tenders for which were opened

at Washington, D. C. The cost of the vessel is estimated at about \$750,000.

The Port of Tacoma has authorized the expenditure of about \$70,000 for cranes and cargo handling machinery to be used at the public terminals at Tacoma. Bids have been invited. The improvement includes a monorail system.

Fuel oil prices on the Pacific coast have been reduced materially during the last month much to the satisfaction of ship operators whose vessels in these waters are practically all oil burners. Oil has dropped from \$1.92 to \$1.32 per barrel and a further reduction is expected.

From East and South

RACING across the Atlantic in sight of each other for nine days, the United States liner *SUSQUEHANNA* recently reached her American port six hours ahead of the North German Lloyd steamer *HANOVER* which had had a start of two hours and 15 minutes.

Because the Hamburg-Bremen berth now is amply protected by privately owned American ships, 10 shipping board cargo carriers operated by the Kerr Steamship Co. between Philadelphia, New York, Baltimore and Norfolk are to be withdrawn in October, according to W. J. Love, vice president of the Emergency Fleet corporation.

Two years of service were completed Aug. 18 by the United American Lines which was organized in 1920 by W. A. Harriman to take over the American-Hawaiian Steamship Co., the American Ship & Commerce Corp., and their subsidiaries. The fleet now consists of 32 vessels of 250,000 gross tons.

Arrangements have been completed with the Latvian government by the International Mercantile Marine Co., for the transit of Russians and Ukrainians through Latvia, the passengers being allowed three months in Latvia to complete their passports and other documents.

Effective Oct. 15, the service of the United American lines, now operating government vessels from New York to India and the Dutch East Indies, will be consolidated with the service now operated in those runs by the Kerr Steamship Co., according to Vice President Love of the Emergency Fleet corporation. The service will be continued under the management of the Kerr company.

Lieutenant Commander Steckel in charge of the Philadelphia branch of the United States navy hydrographic office, reports considerable increase in inquiries from American and foreign vessel masters for data and hydrographic information since last January.

Up to Aug. 18 this year passenger arrivals at Atlantic ports numbered 182,745 persons and departures totaled 263,541.

In the same period of 1921, arrivals were 413,462 and departures 331,549.

The largest cargo of wheat ever loaded at Philadelphia was taken aboard recently by the steamer *ALDERAMIN*. It consisted of 399,431 bushels, loaded by Murphy, Cook & Co. at Girard Point elevator.

The steamer *CAPE HENRY*, of the Atlantic, Gulf & Pacific Steamship Co., recently discharged one of the largest cargoes of forest products ever taken into Norfolk from the Pacific coast. Besides 800,000 feet of fir lumber, consigned to the Norfolk Southern railroad, the *CAPE HENRY* had 10,000 bundles of shingles. Both lumber and shingles were loaded at Bellingham, Wash. Among other cargo discharged were bales of Chinese cotton destined to cotton mills in North Carolina. Though not the first shipment of this kind ever to have been received at Norfolk it is believed to be the largest. Several hundred tons of canned salmon and a quantity of miscellaneous merchandise also were in the cargo.

Change in name from Cape Charles quarantine station to Hampton Roads quarantine station has been authorized by the public health officials in Washington and the new name has become effective at the port.

The British steamer *SOUTHWESTERN MILLER* and the Luckenbach steamer *LEWIS LUCKENBACH* collided recently near Philadelphia and both docked there for repairs. The British vessel had a hole in her port bow and the Luckenbach steamer had a hole in her starboard side aft. Both were inbound, the *SOUTHWESTERN MILLER* from London and the *LEWIS LUCKENBACH* from San Pedro.

On Oct. 1, the city of Norfolk, Va., will make a considerable addition to its holdings of waterfront terminal property. The city council has just authorized the purchase of wharf, pier and warehouse property of the Old Dominion Steamship Co. on Water street for \$650,000. This gives the city one of the most desirable terminals on the inner harbor on a basis which will retire the bonds and leave a substantial balance as the result of leases.

From the South Coast

TWENTY-six wooden shipping board vessels of the Ferris type built during the war at Beaumont, Tex., at a cost of approximately \$10,000,000, were sold in August to Pemberton Bros., New York, for \$21,000. Other property in the yards at Beaumont was sold to about 100 bidders at prices bearing the same relation to cost.

* * *

Southwest Pass, the larger of the two commercial mouths of the Mississippi, is now open to vessels of 30 feet draft. Contract for extension of the jetties, a continuance of the project for 35 feet depth, will be let in the near future. Bids are now before the army engineers at Washington. Approximately \$2,700,000 will be spent on this work during the current fiscal year.

* * *

In pursuit of a program for the most detailed and elaborate technical observation of the situation at the mouths of the Mississippi begun a year ago by Col. F. J. Dent, United States engineer for the New Orleans district, Prof. A. C. Trowbridge of the chair of geology of the University of Iowa, has been employed by the department of war and is now gathering data for a report on the delta at the passes.

* * *

John H. Walsh, general manager of the port of New Orleans, read a paper on the Industrial canal at the annual convention of the American Association of Port Authorities at Toronto, Ont. Sept. 13-16. The report on the possible uses of the canal, submitted to the port commission of New Orleans three or four months ago by A. M. Lockett, a member, and John F. Coleman, consulting engineer, has not been made public. No indication appears that the port commission plans to start the work of completing the canal in the immediate future.

* * *

Shipping men in New Orleans believe that the shipping board will soon get out of the intercoastal service by withdrawing the ships operated by the North Atlantic & Western Steamship Co. A committee of the American Steamship Owners' association cited figures to the shipping board in August showing that in 18 months three representatives steamship companies had 144 westward sailings with a deadweight ship tonnage of 1,687,495 and a cargo tonnage of 505,484 and 122 eastward sailings of 1,407,552 deadweight ship tonnage and 694,391 tons of cargo. The private owners contend that so long as their service is ample the shipping board should keep out.

* * *

Crawford H. Ellis, vice president of the United Fruit Co. and its general manager at New Orleans, announces that orders have been placed with the Radio Co., of America at New York for equipment for five exceptionally large stations that will give continuous wireless communication from Bogota, Colombia on the south to New Orleans and Miami, Fla.,

on the north. The station at New Orleans will be rebuilt. Another will be erected at Miami. Three others will be erected in Honduras and Nicaragua. All will have a radius of 2000 miles. Bogota and Almirante, Panama, will be in easy reach.

* * *

Reports current in New Orleans indicate that the rate war between the United Fruit Co. and the shipping board, operating through the Clyde Steamship Co., on the Colombian berth will soon be brought to an end and the federal ships sold to private operators. The United Fruit objected to competition by the shipping board on the run to Colombia and when its objections were not heeded, cut rates up to 75 per cent.

* * *

Work has been begun at the Johnson Iron Works, New Orleans, on a fire tug of a capacity of 10,000 gallons a minute. The tug costs \$264,000 on a contract calling for completion in 220 days. The vessel will have 30 water outlets and sufficient nozzle pressure to throw streams 300 feet. The outlets include 20 lines of 2½-inch hose and ten monitors with ¾-inch hose connections. The port commission of New Orleans has offered a price of \$50 for the best name for the vessel.

* * *

Citizens of New Orleans, working through a committee of 100, have decided on a spillway at Poydras, where the levee broke this spring and saved the city by lowering the Mississippi two feet, and are now devising ways and means of raising \$4,000,000 to \$5,000,000 to do the work. Protests have come in from towns along the Mississippi sound beyond Lake Borgne that silt coming through the spillway each spring when the river is up will fill Lake Borgne and destroy the oyster and fishing industries. The site was examined by Maj. Gen. Lansing H. Beach, chief of army engineers, in August.

* * *

Passage by the house of representatives of a bill introduced by Congressman James O'Connor to authorize the leasing of the 18,000-ton naval drydock at New Orleans stirred up quite a storm in New Orleans, with the Johnson Iron Works and the Algiers Dry Dock & Ship Repair Co. leading the protest and the Jahnecke Dry Dock & Ship Repair Co. saying nothing. Mr. O'Connor says that unless the dock at the naval station is used it will be moved and the station may be closed forever. Eads Johnson of the Johnson Iron Works says that before spending \$100,000 on improvements, he got assurances from Theodore Roosevelt, assistant secretary of the navy, that the naval dock would not be leased. C. E. Dunbar of the Algiers drydock says that his company will not build its contemplated 10,000-ton dock if it has to meet competition from the government dock.

* * *

Curtailment by the strike of receipts of grain over the rails lowered the quantity

handled at New Orleans to 6,568,798 bushels this August as against 9,722,840 bushels in August of 1921. The July exports were also short about 3,000,000 bushels.

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Tariff collections at New Orleans totalled \$19,653,864 during the first eight months of 1922, an advance of more than \$12,500,000 over the previous high record for the same period.

* * *

Increase in the coffee trade at New Orleans is so pressing on the facilities set aside for this business that the port commission is building mezzanine floors in the wharf sheds to hold coffee. One recently completed in the Poydras street dock is 700 by 50 feet.

* * *

Federal Judge W. B. Sheppard decided at Pensacola, Fla., in August that the intent of the liquor laws was not to withdraw cargo vessels from service and ordered the release, under bond, of the tug RICHMOND and the barge PETER. Prohibition agents at New Orleans have seized and held numbers of fast motor craft on which liquor was found and are now waiting for instructions as to whether they should seize one of the ferries plying between New Orleans and an industrial suburb on the west side of the Mississippi. So far, no ocean going vessels have been seized at New Orleans, although tons of liquor have been taken off of them.

* * *

Formation of sand bars as the Mississippi river falls and the slower current permits heavier deposits, has not been so much of an inconvenience this summer at New Orleans as was expected, although the dredges have been kept busy. Mattresses are being laid at a number of points on the west bank to prevent bank erosion.

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The Ward line ship AGWISTAR's cargo of 48,448 bags of sugar from Cardenas and Manati, Cuba, delivered to the American refinery at New Orleans on Aug. 24, sets a new record for size of sugar cargoes.

* * *

The Southern Pacific Co., operator of the Morgan line between New Orleans and New York, New Orleans and Havana, and Galveston and New York, has given orders for the conversion of all its vessels from coal to oil burners. The MOMUS, the COMUS and the CREOLE have been converted. Next will be the ELRIO, ELIDIA, ELCID and ELSIGLO. The ELSIGLO is now at the Erie basin in Brooklyn in process of conversion. The Southern Pacific has big oil holdings in Mexico and operates its own tank ships. Its locomotives from New Orleans to northern California are practically all oil burners.

* * *

Approximately 100 feet of a wharf 18 feet wide and part of the dock shed at New Orleans were smashed by the Standard Oil tanker JOHN D. ROCKEFELLER Aug. 8, when the ship attempted to dock between the OPHIS of Tacoma and the DELA SALLE of Marseilles. The ROCKEFELLER was temporarily out of control. The owners have disclaimed responsibility for the damage, which equals about \$15,000.

Marine Interests Back 1922 Show

Annual Exhibition in New York Nov. 4-11 Gets Co-operation of
Leading American Societies, Owners, Operators and Builders

AMERICAN marine week will be celebrated at the Grand Central Palace, New York, Nov. 4 to 11 inclusive, when shipbuilders, ship outfitters, ship owners and operators, naval architects and marine engineers and marine supply and equipment manufacturers unite with the American Marine Association, Inc., in furthering interest in the detailed phases of an actual merchant marine.

The United States government is giving the exhibition its hearty support, 33 booths in the exhibit hall will be reserved for the shipping board and 25 booths for the United States navy. Besides the national government's exhibits, a display will be maintained by the Port of New York authority.

The program for Marine week will be one of the most interesting and instructive ever presented at a marine exposition. President Harding may be able to open the exposition in person. The various technical societies have enlisted wholeheartedly in uniting their week's activities with the American Marine Association.

The show will be held simultaneously with the annual meeting of the Society of Naval Architects and Marine Engineers. Other societies will also be in session at various times during the show, including the quarterly meeting of the American Steamship Owners' association and the Ocean Officers' conference. Others supporting the week include the American Society of Marine Designers, the National Merchant Marine association, the Maritime association of the Port of New York, the New York Tow Boat exchange, the Atlantic Coast Shipbuilders association, the Neptune association, the American Bureau of Shipping, the Mississippi Valley association, the Los Angeles chamber of commerce, the San Francisco chamber, and other technical and public organizations.

One of the features of the show will be the display of the model of the steamship *LEVIATHAN* around which will be a group of booths containing exhibits of the Newport News Dry Dock & Shipbuilding Co., which is overhauling the big liner; Gimble Bros., who own the model and the plans of the ship and who have the contract for furnishing the steward's equipment for the vessel; and other contractors participating in the remodeling of the former German steamship.

The marine exposition this year will maintain a consolidated ticket office for

all who visit the show and require sleeping car and transportation accommodations. A transportation committee, with John A. Heuse, eastern manager of the Northern Fire Apparatus Co., as chairman, has been named to negotiate for reduced rates for those attending the show and to handle other traveling accommodations.

Those exhibiting on the main floor, and their booths, are to include:

- 2—American Manganese Bronze Co.
- 3 to 6—General Electric Co
- 7—C. H. Wheeler Mfg. Co.
- 8—Pneumercator Co.
- 12—Victor Eng. Co.
- 13—C. H. Woolsey Paint & Color Co.
- 15—Peabody Engineering Corp.
- 16—Texas Co.
- 17—McCormick, McPherson & Lapham.
- 19—American Steel Foundries.
- 21—Ashton Valve Co.
- 22 to 24—Sperry Gyroscope Co.
- 25—Coffey Engineering Corp.
- 29—W. & J. Tiebout.
- 30—Pantasote Co.
- 31—Lee & Simmons, Inc.
- 32—MARINE REVIEW.
- 33—Hyde Windlass Co.
- 34 to 35—Brunswick-Kroeschell Co.
- 38—Crandall Engineering Co.
- 42—The Babcock & Wilcox Co.
- 44—Underwood & Underwood.
- 45—Valentine & Co.
- 46—Port of New York Publicity Co.
- 47—Keasbey & Mattison.
- 51—*Marine Engineering & Shipping Age*.
- 52—Mercantile Specialties Co.
- 53—Elleon Co.
- 55—Northern Fire Apparatus Co.
- 56—Bristol Co.
- 57—Coen Co.
- 58—National Malleable Castings Co.
- 59—Scovill Mfg. Co.
- 60—The Griscom-Russell Co.
- 63—Diamond Power Specialty Corp.
- 64—Asbestolith Mfg. Co.
- 65—Row & Davis, Engineers, Inc.
- 66—The Superheater Co.
- 68—Crane Co.
- 70—Bethlehem Shipbuilding Corp., Ltd.
- 71—Sterling-Cooper Corp.
- 72—Bethlehem Shipbuilding Corp., Ltd.
- 73 to 74—Wm. Cramp & Sons, S. & E. Bldg. Co.
- 80—Newport News Shipbuilding & Dry Dock Co.
- 81 to 82—Model of Steamship *LEVIATHAN*.
- 83—Gimble Bros.
- 84—Todd Shipyards Corp.
- 85—Westinghouse Electric & Mfg. Co.
- 86—*Marine News*.
- 87—Westinghouse Electric & Mfg. Co.
- 88—Todd Shipyards Corp.
- 90—A—Chase Metal Works.
- 92—A to 93—D—American Balsa Co., Inc.
- 96—Marine Decking & Supply Co.
- 99—Lunkenheimer Co.
- 100—Worthington Pump & Machinery Corp.
- 101—Kingsbury Machine Works.
- 102—Barelay & Vaughan.
- 106—Foster Marine Boiler Corp.
- 106—A—Power Specialty Co.
- 107—P. S. Thorsen Co.
- 108—H. E. Boucher Mfg. Co.
- 111—B. F. Sturtevant Co.

Exhibitors on the mezzanine floor and their booths will include:

- 221—Masters, Mates and Pilots.
- 222—Ocean Association of Engineers.
- 223—Neptune Association.
- 224—American Bureau of Shipping.
- 225 to 227—Maritime Association of the Port of New York.
- 228—New Process Chemical Co.
- 229—American Society of Marine Designers.
- 237 to 245—United States navy.
- 246 to 248—Port of New York Authority.
- 249 to 270—Shipping board.
- 273—Pioneer Co.
- 274—United American Lines.
- 277 to 287—Shipping board.
- 288 to 303—United States navy.
- 304—Crane Packing Co.
- 316—Luckenbach Steamship Co.
- 327—Stamford Foundry Co.
- 344 to 346—American Marine Association, Inc.
- 347 to 349—Society of Naval Architects and Marine Engineers.

Lake Erie Receipts

Out of a total of 9,016,426 tons shipped from upper lake ports in August, Lake Erie ports received 6,845,771 tons, as shown by figures compiled by *MARINE REVIEW*. The balance on dock Sept. 1, was 8,064,101 tons against 9,285,708 tons on Sept. 1, 1921. Detailed figures are:

Port	Gross tons
Buffalo and Port Colborne.....	794,148
Erie	131,756
Conneaut	1,338,366
Ashtabula	1,704,709
Fairport	159,191
Cleveland	1,685,836
Lorain	626,428
Huron	62,142
Toledo	220,928
Detroit	122,267
Total	6,845,771

Pittsburgh Traffic Gains

Traffic on the rivers in the Pittsburgh district in August made a sharp recovery in the tonnage carried, according to the report of the United States engineer office for the district. The aggregate tonnage of the three rivers was 1,088,235, a gain of 235,105 tons over July and an increase of 72,760 tons over June. Coal traffic totaled 398,871 tons in August as against 239,871 tons in July and 331,836 tons in June. The traffic in all other commodities also was greater in August than in the preceding month. The itemized tonnages are as follows:

Commodity	Allegheny	Monongahela	Ohio	Total
Coal	47,560	285,036	66,020	398,871
Coke .....	.....	6,769	.....	6,769
Gasoline	1,400	800	200	2,400
Gravel	121,640	83,216	67,886	272,742
Iron and steel .....	.....	23,545	16,977	40,522
Packet cargo .....	.....	.....	5,240	5,240
Sand	139,535	124,031	74,590	338,156
Unclassified ..	430	2,085	21,275	23,790
Total	310,565	525,482	252,188	1,088,235

Finds Ship Position by Machine

Navigator Builds Instrument Which Eliminates Old Cumbersome Method in Determining Position and Requires Only One Observation

INVENTION and mechanical ingenuity combined have been the means of placing large steam vessels on the ocean, superseding sailing ships because of greater passenger and freight carrying capacity and speed which can not be obtained in sailing vessels. Navigators have not kept pace with the mechanical geniuses who have made it possible to drive a great vessel through the water at the rate of 20 knots or more per hour. Ships are still navigated by the old method used on sailers.

A large steel vessel, which has not been able to check up the deviation of her magnetic compass for two or three days, may be steering a wrong course due to change in magnetism of the vessel as well as magnetism in the cargo. Such a vessel steaming at the rate of 15 knots per hour for two days, without opportunity to check up compass error and the compass having an unknown error of two degrees will put the position out 24.4 knots.

This is not the only defect that causes delay and the lengthening of the passage. No matter how good a helmsman may be, if the compass by which he is steering is sluggish he cannot make a straight course as the vessel is bound to yaw considerably before it is noticed.

From a paper prepared by Capt. Robert Huntington, inventor of the machine described. Captain Huntington is principal of the Navigation and Marine Engineering school of the Seamen's Church institute, 25 South street, New York.

on the compass. This will make an additional error of two degrees and a corresponding error in the position of 24.4 knots, putting the position out 49 knots.

Reckoning that the errors have all been made in the same direction, which is as likely as to have one error counteract the other, and recalling the average expense of operation per hour, which must include coal, oil, food, salaries, water, etc., the extra cost of operating is considerable. Much of this delay and cost can be avoided by the use of a mechanical calculator and the installation of a mechanical compass which is not affected by the influence of magnetism. If the vessel does vary from the true course it will be registered on a card from which the navigator may estimate the course the vessel is making. The gyroscopic compass should not have any error.

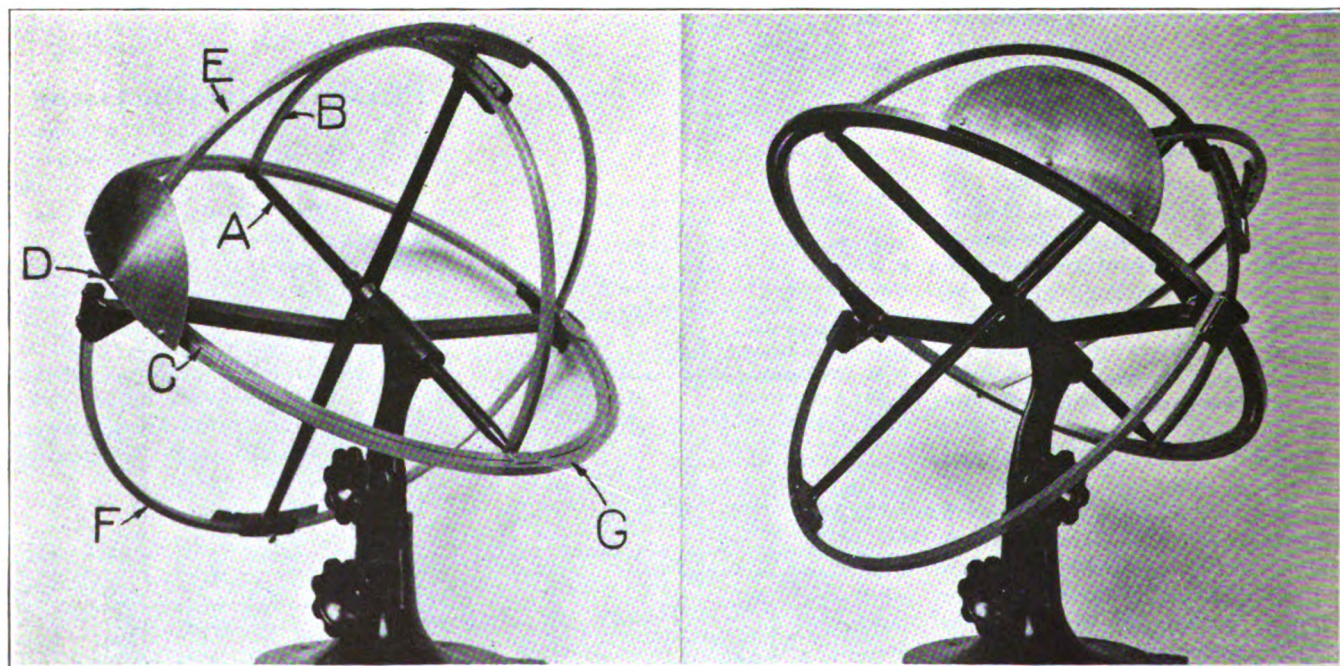
Navigators must exercise the greatest possible care in taking azimuths of the sun, moon, stars or planets for comparison with the true azimuth which is obtained from a book or table that gives it only for every degree of latitude, declination and for every 4 to 10 minutes of time. Carelessness on the part of the navigator will give a wrong true azimuth for comparison with the compass. If the true azimuth is not correct there is bound to be a proportionate error in the course steered. A navigator in getting

the true azimuth must interpolate for the change in latitude, declination and time if there is any change in the true azimuth for these co-ordinates. If this is not done the navigator is likely to make an error of one degree or more, causing that amount in the compass error, which would show an error in a compass that might have no error or an increased error in a compass that has an error.

If the navigator wishes to know the distance any number of degrees will throw the vessel out of the position this simple rule may be followed: Divide the distance made by 60 and multiply the dividend by the number given in the following table for the number of degrees the course is out:

Degrees out	Multiply by
1	1
2	2.1
3	3.1
4	4.2
5	5.2
6	6.3
7	7.3
8	8.4
9	9.4
10	10.4

For example a vessel's course is 4 degrees out and the speed is 15 knots. In 24 hours the vessel has made a distance of 360 knots. Divided by 60 this will give 6. Multiply by the number taken



CALCULATOR FOR FINDING SHIP'S POSITION. FIG. 1—BEFORE ADJUSTMENT. FIG. 2—AFTER ADJUSTMENT TO SOLVE CALCULATION, PAGE 81, BOWDITCH EPITOME

from the table for the number of degrees, gives 25.2 knots that the vessel is out from her correct position.

This error in position might be caused by carelessness in laying out the great circle course, error in getting the true azimuth, compass bearing, bad steering or a sluggish compass. The error in position has to be made good and it adds to the expense of vessel operation. One error might counteract another and the vessel's position be correct but if the errors are all in the same direction they would cause an error which might prove disastrous to the vessel and all on board.

Often it happens that a vessel such as a liner sailing over the same course finds that she is quite a distance out of her position and makes the land several miles to the right or left from the place she intended to make. The error in position is usually laid to an unknown current as that is the most practicable reason advanced by an experienced navigator.

Position From One Observation

The "set of the current" covers a multitude of navigator's sins. The difference between the position found by dead reckoning and that given by observation is usually given as the "set of the current". That is the best the navigator can do unless he has a compass which registers the yawing of the vessel over the course given, from which he can estimate the course made good or unless he has a mechanical means by which errors can be eliminated by getting a true azimuth, the great circle course and distance; and the vessel's position with one observation without the tedious calculation that has to be made by logarithms. Such an instrument has been developed and is called a spherical angle calculator.

The advantage of determining a vessel's position with one observation includes a more accurate position than can be

found by the methods in practical use by all navigators who practice Marc St. Hilaire's method, Johnson's methods, correcting longitude for an error in latitude. In all these, determining a vessel's position or fix is done by intersecting the summer lines of position which have to be at right angles to the true azimuth of the body observed. This requires an interval of time between observations in order to get a sufficient angle to the lines of position to have them intersect as near right angles as possible. This requires a run of the vessel for two to four hours. The first line then is advanced along the true course the distance that the vessel has made in the interval. The fix is going to be in error in proportion to the errors of steering, compass, set of the current, leeway, etc.

A navigator usually has to take the first observation soon after the rising of the sun and the second near meridian to get the best results from the altitudes taken. Being able to determine the fix with one observation will be the means of shortening the passage sufficiently to make a great saving for the company adopting the new method. By the use of the spherical angle calculator a fix is obtained by a few movements of the instrument. True azimuth to the nearest minute is given and the great circle course and distance is given.

Fig. 1 shows the instrument as it would appear before changing any of the parts, with latitude set at zero, the hour angle set at 90 degrees and declination set at zero. *A* represents the earth's axis, securely fastened to the latitude circle *G*; *B* is the declination circle journaled on the axis; *C* is the circle moving around the latitude circle and to it the compass dial is attached at the ship's meridian; *D* is the center of the compass rose representing the ship's position; *E*, journaled at the ship's position, is the zenith

distance circles; and *F* represents the equator and hour angle circle. Fig. 2 shows the instrument as it would appear after making the calculation on page 81, *Boyditch Epitome*, requiring the great circle course and distance between 40 degrees N. lat. 70 degrees W. long. and 30 degrees S. lat. 10 degrees W. long.

To get the zenith distance set the latitude on the latitude circle and clamp; set the hour angle on the hour circle and clamp; set the declination on the declination circle and clamp; the zenith distance is given on the zenith distance circle, and true azimuth on the dial at the ship's position. To get the great circle course and distance from the position, set the latitude on the latitude circle and clamp; set the difference in longitude on the hour angle and clamp. Move the vernier on the declination circle to the latitude of destination. The initial great circle course is given on the dial at the ship's position and the distance is given on the zenith distance circle.

For the identification of stars, the altitude is taken and also the compass bearing, and the compass bearing is corrected for the error which would give the true bearing. The corrected altitude is subtracted from 90 degrees which gives the zenith distance. Move the vernier on the zenith distance circle to the calculated zenith distance and clamp; move the vernier on the declination circle until the true azimuth is shown on the dial at the ship's position. The declination of the body observed is given on the declination circle.

This instrument may be adopted for use on air ships where quick calculation is necessary as the position can be found and the course to steer given and also the distance, without being encumbered with books and charts that are now required and the tedious calculation done by logarithms.

Block and Tackle Need Close Attention

BY CAPT. E. ARMITAGE McCANN

DISCOVERY by primitive man that fibers twisted together formed rope probably led soon after to the invention of some form of block. This first kind perhaps was in the nature of a fair-lead, now called a bullseye, just a piece of wood with a hole in it. But purchases or tackle were not available until wheels were discovered, as without a sheave one would lose more by friction than would be gained by the extra length of rope. Nowadays blocks are to be had in infinite variety, plain or patented, of wood, iron or metal, each suitable for its own purpose and as a rule for no other, ne-

cessitating a large stock, standing and spare, for the well equipped vessel.

For all around work, nothing can beat the old fashioned wooden block, inside iron strapped, with lignumvitae sheave, and patent bushes where they will stand the strain, the more especially where they are liable to be infrequently overhauled, as for instance for boom guy blocks and for davit tackles.

For topping lifts and the like wooden blocks are not suitable; they are heavy and cumbersome in large sizes, equal to the heavy strain imposed upon them, so for this purpose, iron blocks are the best, as in fact they always are

where wire is used. They should however, have metal bushes with holes in the sheaves so that the pins may be easily lubricated, making only an occasional overhauling necessary, and pins in the form of a bolt are better than those kept in position with a cotter pin.

The cargo hoisting blocks should be self-lubricating; there are many methods of achieving this, among the best being a chamber communicating with the pin which could be filled with lubricant through the shell. They should have well curved edges to prevent chafe. The swivel eyes must be kept well oiled and freely working

For a 10-ton lift with a three-fold purchase use a $2\frac{3}{4}$ -inch fall; for a 15-ton lift, a $2\frac{1}{2}$ -inch wire; for a 20-ton lift a $2\frac{3}{4}$ -inch wire; for a 30-ton lift, rig a 4-fold or more purchase with a $2\frac{3}{4}$ to 3-inch wire fall. A big purchase with light wire is better than a slight purchase with heavy wire as the thicker the wire the less flexible it is. For the span holding up the derrick, use a similar purchase and fall to the hoisting purchase.

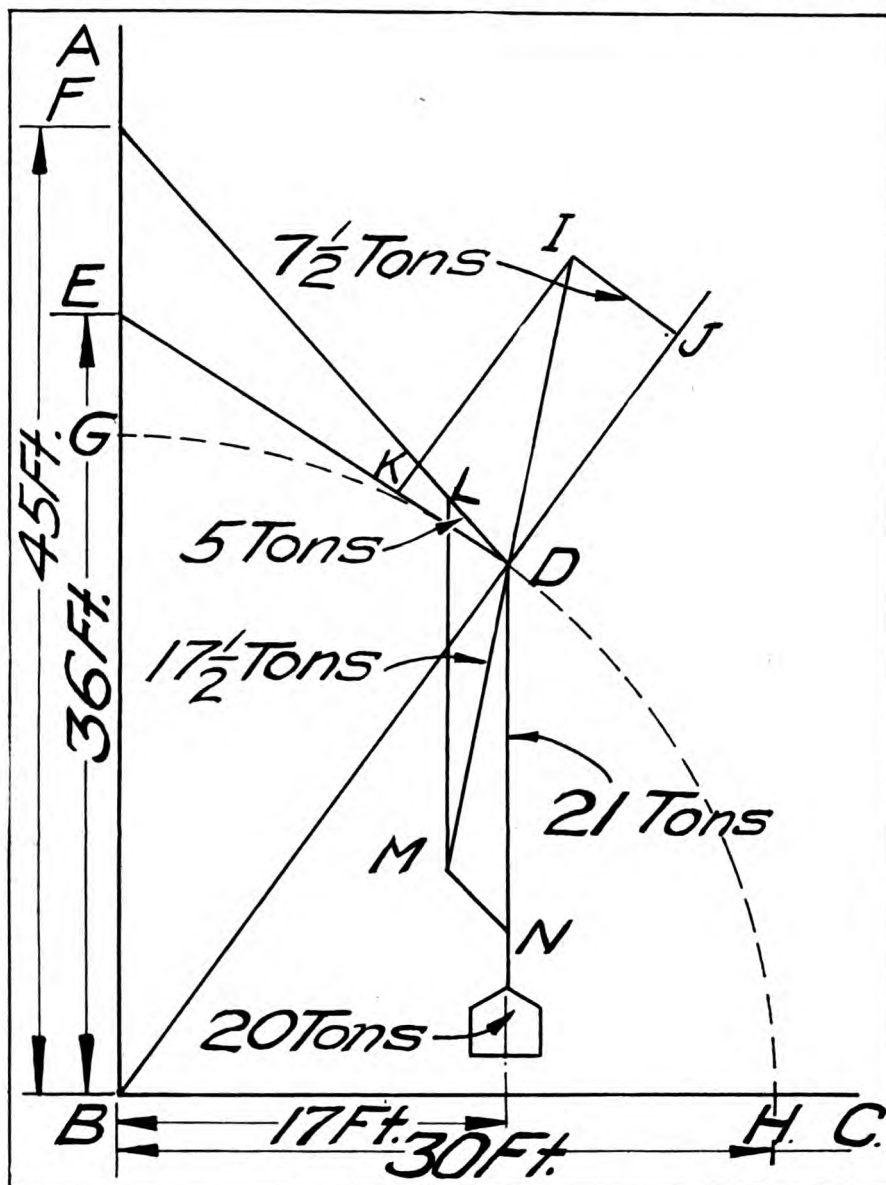
To ascertain what strain there will be on the hauling ply, allow for friction one-tenth of the weight to be lifted for every sheave in use, add that to the weight and divide the result by the purchase or power, which is the number of plies at the lower block. For example, in lifting a 20-ton weight with a 3-fold purchase, there are six sheaves, each with a frictional resistance of two tons, or a total of 12 tons in all. Twelve added to 20 gives a total resistance of 32 tons. As there are six plies in the lower block, 32 divided by six gives 5 1/3 tons, which is the strain on the hauling ply.

The direction in which the hauling ply leads makes considerable difference to the strain on the derrick and span. This may be ascertained by means of a parallelogram of forces which is useful also for many other purposes. To calculate a parallelogram of forces some knowledge of elementary mechanics is necessary.

Suppose 20 tons are to be lifted with a 3-fold purchase and the hauling ply leads from the lower block through a lead block at the derrick head and another at the mast head 45 feet above the deck. The problem is to find the net weight on the derrick head, the thrust on the derrick and the strain on the span.

The derrick is 30 feet long and is stepped at the mast, plumbing the weight 17 feet away. The span is secured to the mast 36 feet above the deck. The two lead blocks may, for friction, be considered as one, so one gets seven-tenths of 20 tons, or 14 tons, which added to the weight makes 34 tons. Dividing 34 by seven and the result is nearly five tons on the hauling ply. Allow one ton for half the weight of derrick and purchase.

Now construct a diagram as shown in the accompanying illustration. AB is the mast, BC the deck and BD the derrick, the head of which is 17 feet from the mast. On DF measure off five tons on any convenient scale. From D measure DN equal to 21 tons. With sides DL and DN as adjacents, construct the



SHOWING HOW TO LAY OUT PARALLELOGRAM OF FORCES IN ORDER TO FIND
NET WEIGHT ON DERRICK HEAD, THRUST ON DERRICK AND
STRAIN ON SPAN

and the pins must be removed frequently to prevent rusting in position, to clean away grit and examine for wear. This applies also to the bushes. Chipped edged on the sheaves should be looked for as these will soon wear the runner to pieces.

In ports where they "whip out" coal or other light cargo the stevedores like the light pattern of gin block, but it is not wise to let them have too spidery a pattern. The cheap blocks of this kind are always coming apart or opening up and letting the rope jam between shell and sheave, causing delay and cut rope. If this pattern is used they should be just as well constructed as any other, but as a general rule the ordinary hoisting blocks serve the purpose after the prejudice of the stevedores is overcome.

For cargo lead blocks it is best to

hark back again to the wooden type, only with solid sheaves, metal bushed, unless for use with wire. Snatch blocks also should be wood or iron according to whether manila or wire rope is to be used. Several sizes and kinds should be carried. There are many patterns. Mast or other heavy tackle blocks also should be of wood or iron, but in either case they should be thoroughly overhauled before using.

Wooden block are usually measured by the length of the shell, which should be at least three times the circumference of the rope to be used. Iron blocks go by the size of the sheave which should be not less than 15 times the diameter of the wire rope.

It is important that sufficiently large blocks be used as running the rope over too small a sheave not

parallelogram *DNML*. The diagonal measures $17\frac{1}{2}$ tons, weight on the derrick head, using the scale to which *DF* was laid out. Produce *MD* up to *I* making *DI* equal *MD*. On *BD* and *DE* describe the parallelogram *DJIK* having *DI* as a diagonal. *DJ* measures 16 tons, thrust on the derrick. *DK* measures $7\frac{1}{2}$ tons, the weight on the span.

If the fall had been led direct to the winch, the weight on the derrick head would have been $25\frac{1}{2}$ tons, the thrust 23 tons and the weight on the span 12 tons.

To sum up, a well made block soon pays for itself in the saving of rope and time. Have a good stock of blocks aboard, pick out the right one for each job and see that it is thoroughly overhauled frequently.

Fog Sends Fast Pacific Liner on Rocks

The largest repair job in the Puget Sound district for some years resulted from the collision of the palatial coast-wise steamer *H. F. ALEXANDER* with Cake rock on the morning of Aug. 7, while the vessel was proceeding on her regular run from San Francisco to Seattle.

Upon arrival at Seattle, the vessel was, on Aug. 9, taken to the plant of the Todd Dry Docks, Inc., and placed on its 15,000 ton drydock for survey. It was found that the entire bow, in-

cluding forepeak tank, chain locker and No. 1 double bottom were carried away, necessitating their renewal as well as the shell plating and intermediate decks back to No. 1 hold and hawse pipes, anchors and all deck fittings.

The Todd Dry Docks, Inc., was awarded the contract for making the repairs and, proceeding on continuous time, completed the job in the remarkably short time of 20 days, so that the vessel resumed her run on Aug. 29. In making these repairs, approximately 250 tons of steel were removed and replaced.

This job is believed to establish a record for fast work as time was the essence of this contract. The entire bow for a distance of 25 feet in the upper section was completely restored and the keel plates for a distance of 40 feet back from the bow were renewed. The photograph shows the extent of the damage. The accident took place at an inopportune time for the palatial liner lost three round trips between Seattle and Californian ports for which all her accommodations had been sold in advance.

Dense fog covered the north Pacific when the *H. F. ALEXANDER* bumped Cake rock off the Washington coast. This obstruction is about 20 miles south of Cape Flattery and is in the midst of a number of high boulders constituting what is known as the graveyard of the north Pacific. Testimony at the trial of Capt. E. P. Bartlett, who was in command, indicated that the vessel's

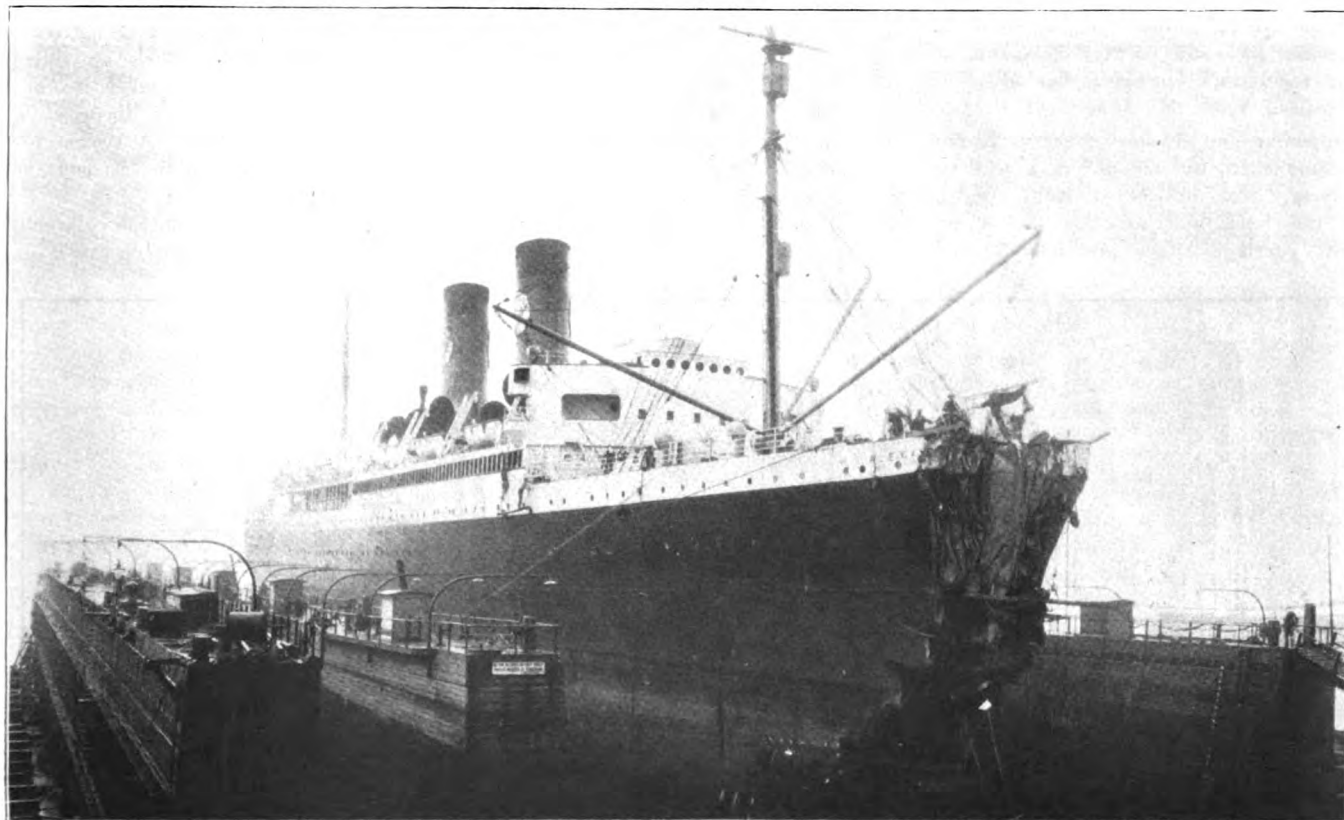
compass was not functioning accurately. The evidence shows that frequent soundings were taken and that due caution was being observed.

The mishap is regarded as one of the most fortunate—if such a term may be used—in the history of north coast shipping. There were no accidents to any of the 300 passengers and 225 officers and crew. The *ALEXANDER* backed away from the menacing obstruction and slowly made her way into the Straits of Fuca where a relieving steamer took off the passengers. The disabled liner proceeded to Seattle under her own power, convoyed by tugs, the forward bulkhead holding intact and keeping her afloat. The ship was insured in London with small lines in New York and San Francisco.

The inspectors have not yet rendered their decision in Captain Bartlett's case.

Clear Officers of Blame in Two Collisions

United States steamboat inspectors after investigating two costly collision cases in Puget sound waters have absolved the navigating officers concerned from blame. The first case was the sinking of the steamer *HENRY T. SCOTT* by the steamer *HARRY LUCKENBACH* near Cape Flattery, July 10, and the second was the loss of the small wood vessel *CALISTA*, sunk in collision with the Japanese steamer *HAWAII MARU*, near Seattle, July 27. Both mishaps were due to fog. The inspectors found the vessels were cautiously handled.



LINER *H. F. ALEXANDER*, FORMERLY *GREAT NORTHERN*, IN DRYDOCK AT TODD PLANT, SEATTLE, AFTER BEING DAMAGED BY STRIKING ROCK OFF THE WASHINGTON COAST

Equipment Used Afloat, Ashore

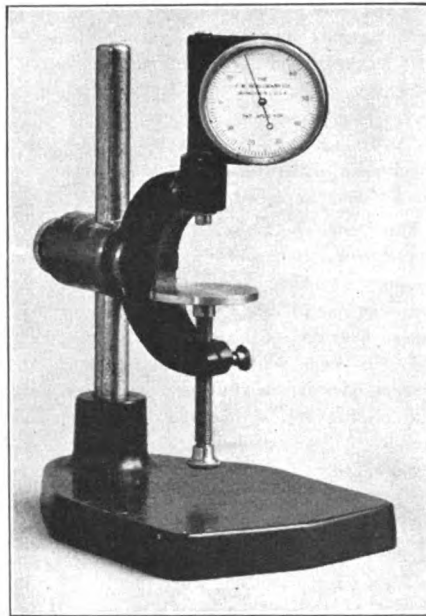
Swing Gate Valve Gives Even Pressure—Indicating Caliper—Boiler Tube Cleaner—Electric Stevedore

ACCESSIBILITY for regrinding purposes without dismounting is one of the features of a swing gate valve brought out by the Schutte Koerting Co., Philadelphia. The valve is designed for steam pressure up to 300 pounds per square inch and temperatures up to 750 degrees Fahr. The body is of cast steel and the valve seat rings are of nickel composition.

Another feature is that when the valve is open, the passage through the valve has the same full aperture throughout as the pipe, giving practically no pressure drop even at high steam velocities. It affords no obstruction to the steam flow nor gives a change of direction, according to the makers. Fig. 2 shows the valve in open position. This permits use of smaller pipes. Closing is effected by the disk indicated in Fig. 1 which is rigidly connected to a swing link suspended on a shaft.

Attached to the swing link is a threaded disk stud which is secured to the valve disk by means of a disk nut. The disk is so designed, it is stated, to insure a perfect seating of the contacting surfaces. The purpose of the spring shown in Fig. 1 is to prevent vibration of the disk and at the same time to give flexibility of operation.

Opening and closing of the valve are accomplished by means of a sliding carriage that moves at right angles to the horizontal axis of the body. This carriage slides practically with-



DIAL GAGE AND STAND

out friction. It is rigidly attached to the vertical rising spindle, as shown in the figure, and can be moved up or down by turning the hand wheel.

To grind the valve seat, the bolts binding the bonnet to the housing are first removed. Then the pin connecting the forked link, also shown in Fig. 1, and the swing link is removed and all the internal parts are taken out with the exception of the swing link and the valve disk. The grinding operation is performed in the customary manner by adjusting a suitable wrench in the end of the disk stud as shown in Fig. 3.

Indicating Caliper

The tool shown in the accompanying illustration is an indicating caliper developed by the F. W. Horstmann Co., Irvington, N. J. The device embodies a base carrying an upright for the accommodation of a saddle that clamps the caliper frame in place, while the dial head can be swiveled in a complete circle to facilitate ready readings. This tool can be used for duplicating work and for inspection purposes. It is set accurately at zero by the anvil screw which can be clamped in place after the setting is made. With the tool set correctly, the indicator hand registers under or oversize work in thousandths of an inch.

Designs Cleaner To Free Boiler Tubes from Soot

Maximum efficiency of boilers may be obtained by keeping tubes and other heating surfaces free from soot which is an effective heat insulator. Until recent years it has been the practice to clean fire surfaces of marine boilers by hand methods, using a single nozzle steam lance to blow each tube individually. Improvements have been made, however, and among them is a tube and combustion chamber cleaner which blows an entire tier of tubes at a time and is so arranged as to blow all of them in a comparatively short time. A typical installation may be seen in the accompanying illustration.

The blower gains its efficiency largely from the fact that in each operation of

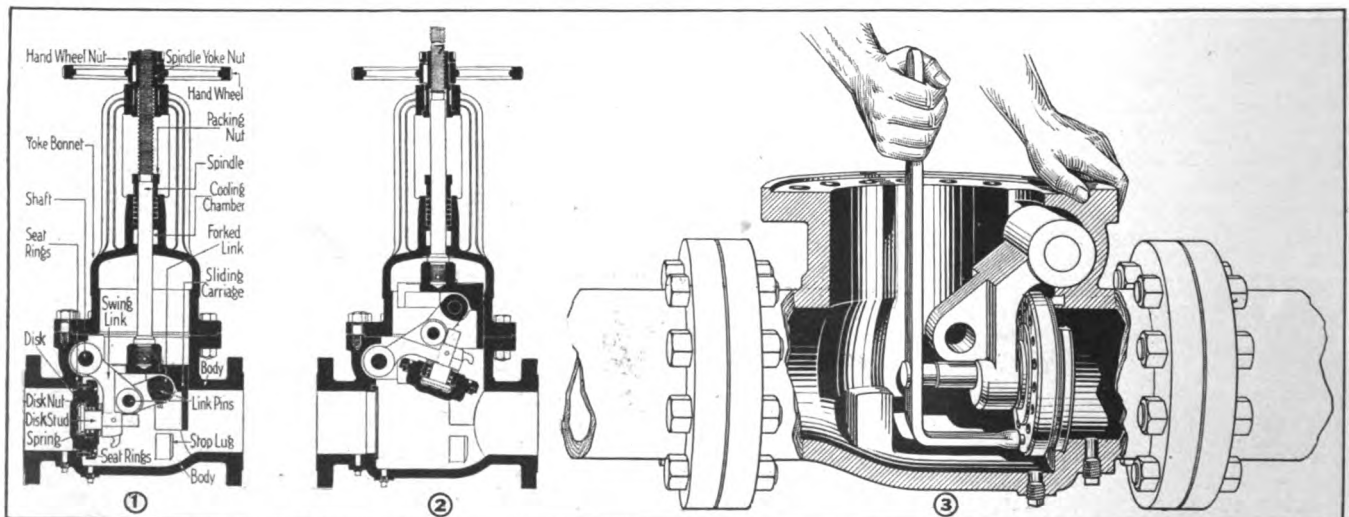
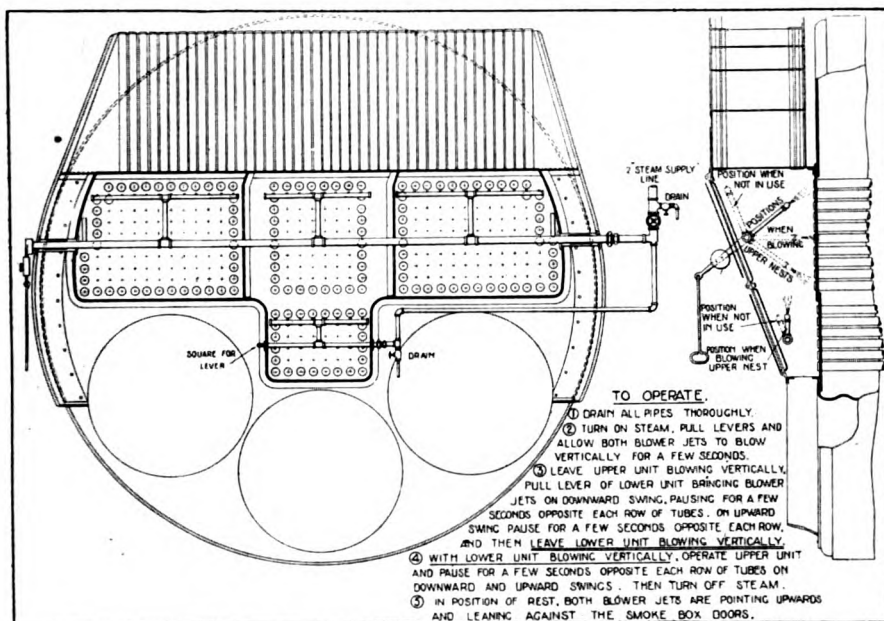


FIG. 1 SHOWS REGRINDING SWING GATE VALVE IN CLOSED POSITION. FIG. 2 ILLUSTRATES THE OPEN POSITION. FIG. 3 ILLUSTRATES METHOD OF REGRINDING



END VIEW AND SECTION OF BOILER SHOWING BLOWER INSTALLATION

the blower one unit is blowing directly into the uptake, greatly intensifying the draft, while the other element is blowing through a section of the tubes to the back of the boiler. The velocity of the steam at the back end is expended against the wall of the combustion chambers, where it scatters. This agitates and suspends the light ash and soot which, by reason of the intense draft is drawn through the tubes to the front and blown out of the funnel. The builder says that a great number of jets of steam giving considerable volume and blowing in a direction to increase the natural draft of the boilers will accomplish more in removing soot and ash entirely from the boiler with a smaller final expenditure of water and steam than would be in the case of a single jet operated over a longer period and not taking advantage of increasing the draft.

N. E. McClelland & Co., Ltd., 283 St. James street, Montreal and 2 Stone street, New York, which until recently held the Canadian rights on this tube blower, have now obtained the exclusive manufacturing and selling rights throughout the world. They state the blower and cleaner has been installed in a number of vessels of the leading steamship companies on the Atlantic coast and the Great Lakes and assert that its performance has been highly satisfactory. Some of their recent installations also include vessels of the Ellerman & Bucknall Steamship Co., Ltd., Shaw, Savill & Albion Co., Ltd., and the Australian Commonwealth Government Lines as well as a number of ships under Canadian registry.

Plans for a pilot boat for service at the mouth of the Columbia river are being drawn by the Port of Portland.

Employ Electric Trucks in Stevedoring

An electric self-loading industrial truck is being manufactured by the Elwell-Parker Electric Co., Cleveland, for use on docks in loading and unloading ships and for other purposes. Among the latest sales was one to a stevedoring company at Sydney, Australia. These trucks already are in operation on the wharves at New York, London, Melbourne, and other ports.

The truck is described as a motor on four wheels with a flat shoe similar to the top of a table. This shoe can be elevated or lowered as required. The shoe slips under a tray which rests on a trolley. The shoe lifts tray, trolley and cargo up to 4000 pounds and moves them where

directed. The tray is fitted with rings into which slings from ship may be slipped and the tray and load lifted aboard or off ship. The speed with which the truck operates will permit four gangs of men to be employed, two aboard and two on dock, in handling a ship's cargo.

Expand Engineering Firm

Fay, Spofford & Thorndike, 200 Devonshire street, Boston, consulting engineers, have admitted to partnership John Ayer, Bion A. Bowman, Carroll A. Farwell, Ralph W. Horne, Ralph T. Jackson, George L. Mirick, Barzillai A. Rich and Warren D. Trask. All have been long associated with the firm, the original partners of which are Frederic H. Fay, Charles M. Spofford and Sturgis H. Thorndike. The firm, which engages in engineering for bridges, buildings, foundations, port developments, river and harbor work, industrial plants, hydraulic developments, etc., recently moved from 15 Beacon street, Boston.

Again Elected President

For the eleventh year in succession, H. F. Alexander has been elected president of the Pacific-Alaska Navigation Co., holding corporation for the Pacific Steamship Co. Mr. Alexander formed the company in 1912 and since has remained as its chief executive. The company's directors were recently elected at the annual meeting of the stockholders at Bath, Me. The other officers are: Chester Thorne, Tacoma, chairman of the board; R. Stanley Dollar, San Francisco, first vice president; E. A. Stuart, Seattle, second vice president; Frank Woolsey, Seattle, secretary; and F. H. Hall, Seattle, treasurer. The latter succeeds A. Melville Dollar, resigned.



ELECTRIC TRUCK TAKES CARGO TO SHIP'S SIDE

Business News for the Marine Trade

A building has been acquired by the Hendry Machine & Engineering Co., Ft. Myers, Fla., which was recently organized. This will be utilized for a boat-building and repair works. A department will be established for cylinder grinding work. W. F. Lusk is general manager of the company.

The Johnson Iron Works, Dry Dock & Shipbuilding Co., New Orleans, will start work soon on the installation of a new 5000-ton dry dock, forming an additional section to dock No. 1. It is estimated it will cost about \$100,000, including equipment.

The Biscayne Yacht & Machine Works, Miami, Fla., has plans under way for enlargements to its plant, and it is understood will install new machinery for the construction and repair of yachts and other light vessels. S. Pearlman is general manager of the company.

The Willamette Iron & Steel Works, Portland, Oreg., will make extensions and improvements at its 1-story boiler shop at an estimated cost of \$40,000.

The Lehigh Coal & Navigation Co., Lansford, Pa., will commence the immediate construction of new coal-loading docks and storage plant on the Lehigh canal near Northampton, Pa., which will replace its present plant at Coalport, near Mauch Chunk, Pa. The docks will be of reinforced concrete and will be equipped with cranes and complete loading machinery. The storage plant will be similarly equipped and will have a capacity in excess of 2,000,000 tons. It is estimated the project will cost in excess of \$500,000.

The Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., has acquired property on Pinto island and plans the erection of a new shipyard. The present plant of the company, it is understood, will be moved to the new location and extended.

The William Cramp & Sons Ship & Engine Building Co., Richmond and Norris streets, Philadelphia, is reported planning enlargements to its drydocks, including the addition of shop and repair facilities.

The Coatesville Boiler Works, Coatesville, Pa., is disposing of a bond issue of \$300,000, a portion of the proceeds to be utilized in the purchase of additional equipment.

The Twin Parts Marine Construction Co., Superior, Wis., has been incorporated with a capital stock of \$100,000 preferred and 1000 shares of common stock with no par value, to build and repair vessels. The principal is C. A. Massey who has been engaged in general vessel repair work for years. C. J. Hartley and L. A. Hanitch appear with Mr. Massey as incorporators. It is understood the company will occupy the site of the Globe yards at Superior, including the buildings and drydock.

The Merrill-Stevens Drydock & Repair Co., Jacksonville, Fla., has acquired the local plant and business of the T. Murphy Iron Works and will use the property for enlargement of its plant.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., recently bought 21 two-ton floor-operated electric hoists, one 5-ton riveter hoist and one 5-ton, single I-beam trolley, from the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

The Merchants' Shipbuilding Corp., Chester, Pa., is arranging to devote a portion of its plant to railroad car and locomotive repair work, and has negotiations under way for contracts of this character. R. H. M. Robinson is president of the company.

Traveling cranes, freight handling and con-

Late Marine Patents

Copies of any one of these patents can be obtained by forwarding 25 cents in stamps to Siggers & Siggers, patent attorneys, National Union Insurance building, Washington, and mentioning MARINE REVIEW.

1423576—Towing vessels, Thomas S. Miller, Orange, N. J.

1423923—Diving apparatus, James C. Eckert Jr., Stamford, Conn.

1424174—Life saving suit, James F. Mordica, Philadelphia.

1424227—Boat launching apparatus, George Wright, San Francisco.

1424641—Marine trailer for radiant energy receiving systems, John Hays Hammond Jr., Gloucester, Mass.

1424672—Propeller, George A. Oriscek, Jersey City, N. J.

1425179—Propeller, Albin Danielson, Brooklyn, assignor to one-half to Hilmer Johnson, Brooklyn.

1425308—Unit pump for submerging service, Walter R. Woock, Herbert J. Woock and Erick M. Woock, Lodi, Cal., assignors to Superior Mfg. Co., Lodi, Cal.

1425471—Apparatus for submarine work, Arthur B. Hansen, New York.

Freight handling and conveying machinery, etc., will be installed on the proposed new pier to be constructed by the port development commission, Baltimore, at the McComas street terminal.

Freight handling and conveying machinery, etc., will be installed at the Tampa, Fla., harbor in connection with wharf and dock extensions and improvements to be made by the city at an estimated cost of \$600,000. A. D. Hall is city manager in charge of the project.

The New York Harbor Dry Dock Corp., 32 Pearl street, New York, will install a new 10,000-ton drydock with additional shop facilities at its yard at Rosebank, S. I. Other enlargements are under way, including the purchase of drydocks owned by the United States shipping board and heretofore leased. The company has arranged for an increase of \$1,750,000 in plant investment. Charles E. Fraser is president of the company.

The Marine Engineering & Dry Dock Co. and the Lord Construction Co., Providence, R. I., have been purchased by Frederick S. Peck, Providence. It is Mr. Peck's intention to sell the machinery and other equipment of the plants.

The bureau of yards and docks, navy department, Washington, has awarded a contract to W. F. Martens, 112 Cutler building, Rochester, N. Y., for a machine shop at the naval base at Pearl Harbor, H. I., which will be built at an estimated cost of \$185,366.

The Pelsang Boat Works, Inc., Miami, Fla., recently organized with a capital stock of \$50,000, will establish a marine construction and repair plant.

William F. Schnick & Co., 720 South Caroline street, Baltimore, has increased its capital stock by \$75,000.

Capitalized at \$10,000 the Verplanck Shipyard & Repair Corp., Verplanck, N. Y., recently was incorporated by C. R. and G. R. Bleakley and W. P. Foss. Barber & Gibboney, 165 Broadway, New York, are attorneys for the company.

To operate a shipyard at Noank, Conn., formerly that of the Groton Iron Works, the Noank Yard, Inc., Augusta, Me., recently was incorporated with a capital stock of \$100,000

by D. A. Leland, W. T. Gardiner and C. L. Andrews.

The New England Steamship & Commission Co. of Connecticut, has been organized with a capital stock of \$1,000,000 to handle the citrus fruit trade from Savannah, Jacksonville and Beauport to Connecticut and New England.

Organized to operate a ferry service between Collinsville and Pittsburgh, Cal., the Pittsburgh-Sacramento Ferry Co., Pittsburgh, Cal., recently was incorporated with a capital stock of \$250,000.

The Stevedoring Co. of Philadelphia, 415 Otis building, has been organized to conduct a general stevedoring business. The new company is equipped to load and discharge vessels of any and all classes and also states that it has unlimited facilities for the disposal of ballast of every description. The officers of the company are: President, A. F. Porter, and secretary and treasurer, Nelson H. Gilderslieve.

Construction on the first unit of the \$500,000 plant of the Washington Iron Works, Seattle, has been started. The boiler shop is the first building to be erected, this being 70 x 570 feet, two stories, of steel construction, costing \$100,000.

The Mid-West Boat & Barge Co., Inc., Water Front and Oak streets, Grafton, Ill., has been incorporated with a capital stock of \$50,000, by Samuel Edwards, Albert A. Coyle, John F. Erdelen, Maurice Killeen and others. The company is represented by Samuel Edwards.

The Marine Equipment Co., Aberdeen, Wash., will start work soon on the erection of the first unit of its proposed plant.

Reorganization of the Niagara Welding & Boiler Works, Niagara Falls, N. Y., has resulted in dissolution of the old company of that name and the incorporation of a new one of the same name with \$25,000 authorized capital stock. Incorporators are W. I. Grantham, B. L. Moore, H. J. Cantara and J. A. Noonan.

New Trade Publications

TURBO-BLOWERS AND TURBINES—The Power Turbo-Blower Co., New York, has published a 32-page illustrated booklet in which turbo-blowers and turbines are described. The equipment is described in detail as to operation, construction, etc. The latter part of the booklet contains a number of illustrations showing installations.

STEAM PUMPS—A 40-page illustrated booklet has been published by M. T. Davidson Co., Brooklyn, N. Y., in which pumps for all steam plant service are outlined. A general description of the pumps is given as well as information regarding care and operation, and complete specifications. The booklet is profusely illustrated.

OIL PURIFICATION—The De Laval Separator Co., Chicago, has published a 56-page illustrated booklet in which a method of purifying lubricating oils, transformer oils and switch oils is described. In brief the bulletin covers the centrifugal purification of turbine and diesel lubricating oil on land and sea, and also the dehydration of transformer, switch and other insulating oils. The treatise is thorough and is supplemented by numerous illustrations.

STOCKS AND DIES—The Armstrong Mfg. Co., Bridgeport, Conn., is circulating a 64-page catalog in which stocks and dies, water, gas and steam fitters' tools and pipe threading machines are described and illustrated. Special attention is called to the machines for threading and cutting off pipe.